

Chesapeake Chemist

*Maryland Section
American Chemical
Society*

McCormick & Company Dr. Carolyn Fisher



Wednesday, March 13, College of Notre Dame

The Johns Hopkins University 2002 Spring Chemistry Colloquium Schedule

Remsen Hall, room 233, Tuesdays, 4:15 p.m.

For more information contact Rosalie Elder, 410-516-7432

- March 12 Professor JRobert Hamers, University of Wisconsin
Molecular Architecture at Organic-Inorganic Interfaces
- March 26 Professor Jonathan Sessler, University of Texas, Austin
Oligopyrrole-based Anion Binding Agents
- April 2 Professor Timothy Zwiernicki, Purdue University
Laser Probes of the Potential Energy Landscapes and Dynamics
of Small, Flexible Biomolecules
- April 9 Professor Sylvia Ceyer, Massachusetts Institute of Technology
New Surface Reaction Mechanisms: Role of Bulk H in Catalytic
Hydrogenation and F Atom Abstraction by Si--
- April 16 Professor Jeehium K. Lee, Rutgers University
Insights into Nucleic Acid Reactivity Through Gas Phase
Experimental and Computational Studies
- April 23 Professor Tom Muir, Rockefeller University
Protein Ligation: Linking Chemistry and Biology One
Peptide Bond at a Time
- April 25 Professor Marcetta Y. Darensbourg, Texas A&M University
(Thursday) Hydrogen Activation Processes in Fe-only Hydrogenase
Model Complexes
- April 30 Professor Lyle Isaacs, University of Maryland
Hydrophobic Self-Assembly

The Magic of Chemistry

The Maryland Section of the American Chemical Society, along with the first-year advisors in the Towson University Department of Chemistry, is sponsoring "The Magic of Chemistry," presented by Alan Pribula and Liina Ladon.

These two "magicians," members of the university's Department of Chemistry, will give demonstrations showing chemistry's playful side, including sudden color changes, "clock" reactions, preparation of "hard water" (which then turns into "fire water"), a chemical "traffic light," a volcano, chemiluminescence, and spontaneous fires. And what would life be like if the temperature outside dropped to -196°C? Come and find out and put a little "magic" into your life!

The event, opened to students, faculty, staff, and administration will be held on Thursday, April 4, at 4:15 pm, in the university's Smith Hall, rooms 554 and 556.

Chesapeake Chemist

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March 2002 Meeting

Wednesday, March 13, 2002

Doyle Formal Dining Room
College of Notre Dame of Maryland

Schedule

6:00-6:30 pm	Registration & Social Reception
6:40 - 7:40 pm	Dinner
7:40-7:50m	Local section announcements Introduction to keynote speaker
8:00 - 9:00 pm	Science Careers in the Food Industry/ Spices and Herbs: Chemistry and Health Dr. Carolyn Fisher. McCormick & Company, Inc. Hunt Valley, MD

Cost:

Members, \$16.00; Retired members, nonmembers, and spouses, \$13.00; Students, \$8.00
For reservations, call Shirish Shah, 410-532-5712, or e-mail him at sshah@ndm.edu.

The College of Notre Dame is located at the intersection of Charles St. and Homeland Ave. in north Baltimore City, and just north of Loyola College.

Science Careers in the Food Industry

The first few minutes are used to describe my personal experiences in the food industry, then the Institute of Food Technologists' VHS videotape "In Good Taste: Careers in Food Science" (length 14:22 min.) is shown. The focus here is that the food industry needs scientists that majored in biology, chemistry, chemical engineering and, of course, food science. The students usually appreciate at this point a description of the entry level jobs in Quality Control, Research & Development, and Technical Sales. Then depending on the audience, either a question and answer session ensues or a discussion develops about the types of chemical reactions that occur in foods and how the chemist is needed to understand and control them.

Spices and Herbs: Chemistry and Health

A general overview of the components of spices and herbs is presented, along with their attributes for the food industry. Bioactivities of these components will be discussed, with emphasis on antimicrobial, antioxidant and anticarcinogenic activities.

Upcoming meetings:

The dinner dates for our meetings are as follows:

18 April 2002	Western Maryland College - Student Awards Night
17 May 2002	Belmont - 50-year Membership Luncheon
29 May 2002	Johns Hopkins University - Remsen Award

About the speaker:

Carolyn Fisher received her B.S. in 1972 from Wayne State University and Ph.D. in 1978 from Stanford University. She was engaged in the research of separations at Kalsec from 1978 to 1991. She began with the purification and analysis of hop compounds and went on to establish HPLC separation procedures for many different spice extracts. She has developed an economic process for the production of purified capsicum extracts. In collaboration with researchers at Rutgers and the University of Illinois, Urbana-Champaign, isolated spice compounds were tested for anticarcinogenic activity. At the University of Delaware from 1992 to 1996, she continued her work on the phenolic compounds isolated from plants and how they affect our food and health, and she wrote the book *Food Flavours: Biology & Chemistry*.

Dr. Fisher's current responsibilities at McCormick & Company include the design, implementation, and maintenance of quality systems for industrial flavor products. She spends much of her time facilitating communications between production, product development and research groups.

Job Fair Participants

The Fourth Annual Job fair took place on February 28. The Maryland Section of the ACS would like to thank the following organizations for participating.

Employers

Baltimore Museum of Art	Chesapeake Bay Foundation
Baltimore Occupational Safety Office	Guilford Pharmaceuticals, Inc.
Baltimore Zoo	Lab Support
Bimax, Inc.	MDBio
BioReliance	Millennium Corporation
Cabrex Bio Science, Inc.	McCormick & Company, Inc.

Graduate Programs

Community College of Baltimore County, Essex, and Towson Physician Assistance Program

Johns Hopkins University, Department of Chemistry and Biochemistry

Morgan State University, Department of Chemistry

Towson University, Department of Chemistry, Post-bac Medical & Dental Programs

University of Delaware, Department of Chemistry and Biochemistry

University of Maryland, College Park, School of Nursing, Department of Chemistry and Biochemistry

University of Maryland, Baltimore, School of Pharmacy

University of Maryland at Baltimore County, Department of Chemistry and Biochemistry, Policy Science Graduate Program

Boucher receives Maryland Service Award

Dr. Laurence Boucher, professor of general and inorganic chemistry at Towson University, is the recipient of the ACS Maryland Section's 2002 Maryland Service Award, in recognition of his outstanding leadership of the Middle Atlantic Regional Meeting (MARM). Dr. Boucher received the award at Villa Julie College, Wednesday, February 20, 2002, at the monthly dinner meeting.

Nobel Prize in Chemistry, 2001

by Leopold May

The prize in chemistry, for 2001 was awarded with one half jointly to **William S. Knowles** and **Ryoji Noyori**, for their work on chirally catalysed hydrogenation reactions, and the other half to **K. Barry Sharpless**, for his work on chirally catalysed oxidation reactions.

Catalytic asymmetric synthesis today proved a nice little earner for William Knowles of Monsanto in St Louis, Missouri, Barry Sharpless of the Scripps Institute of Research, La Jolla, California, USA, and Ryoji Noyori, of Naqoya, who were awarded this year's Nobel Prize for Chemistry.

The enantioselective synthesis of a wide range of compounds from pharmaceuticals to agrochemicals has become of increasing importance in recent years as pressure is applied on the industry to create just one chiral form of countless products, not only to ensure safety but also to reduce waste and improve the atom efficiency of syntheses.

In the 1960s, Knowles was investigating catalytic asymmetric hydrogenation. There were two key developments that paved the way for him. The first was Osborn and Wilkinson's rhodium complex, $(PPh_3)_3RhCl$, which could quickly hydrogenate olefins. The second was Horner and Mislow's route to chiral phosphines. Knowles' insight was to swap Wilkinson's triphenylphosphine for the enantiomer of a known chiral phosphine to provide enantioselectivity in the hydrogenation of olefins. His discovery eventually yielded the Monsanto Process for making the Parkinson's drug L-DOPA and much more besides.

Knowles' work has inspired many chemists to find yet more effective chiral catalysts and although Noyori had published work in 1966 on the enantioselective cyclopropanation of olefins it was his generalization of hydrogenation in 1980 with the development of the chiral diphosphine BINAP [BINAP = 2,2'-bis(diphenylphosphino)-1,1'-binaphthyl] and its rhodium complexes for which he is perhaps best known. Rh(I) complexes of the enantiomers of BINAP are remarkably effective in many asymmetric reactions.

Sharpless meanwhile was focusing on oxidation. He devised an epoxidation reaction in 1980 that offers almost total stereochemical control. Titanium(IV) tetraisopropoxide, *tert*-butyl hydroperoxide, and an enantiomerically pure dialkyl tartrate are the components of his eponymous reaction, which allows the chemist to carry out the epoxidation of allylic alcohols with excellent stereoselectivity in a very predictable way.

Today, the products of the basic research of these three chemists are at the heart of countless industrial syntheses for antibiotics, anti-inflammatories, heart drugs, fragrances, and pheromones.

March Historical Events in Chemistry

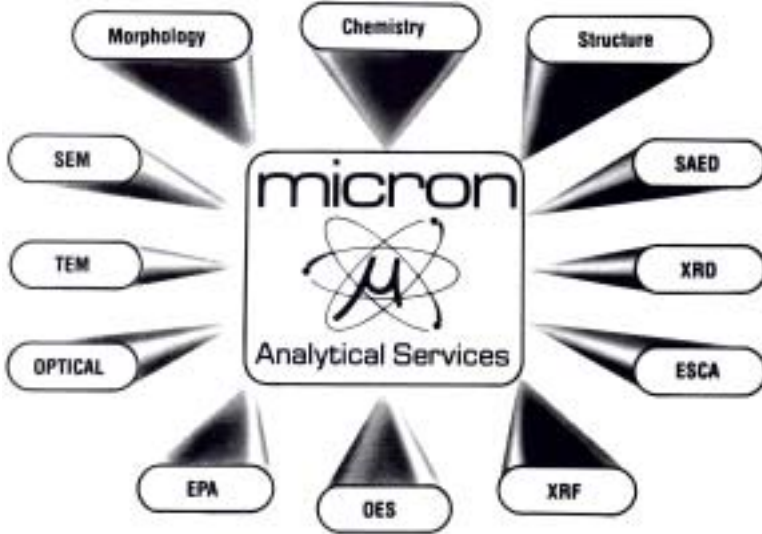
by Leopold May, The Catholic University of America, Washington, D.C.

- March 2, 1886 Birthdate of H. Jermain Creighton, who was a researcher in electroorganic chemistry. He developed industrial process for electroreduction of glucose to sorbitol and mannitol.
- March 4, 1947 On this date, Willard Libby and colleagues made the first radiocarbon age determination.
- March 6, 1857 Birthdate of Arthur Hantzsch, who was a researcher in organic acids, electrical conductivity of organic compounds, and the stereochemistry of nitrogen compounds.
- March 9, 1856 Birthdate of Edward G. Acheson, a pioneer in the development of the electric furnace for production of SiC. He also prepared the graphite lubricants Oildag, Aquadag, and Gredag.
- March 11, 1864 Cato M. Guldberg & Peter Waage presented their paper “Studier over Affiniteten” describing the Law of Mass Action to the Norwegian Academy of Sciences and Letters.
- March 13, 1733 Joseph Priestley, born on this date, discovered oxygen, ammonia, hydrochloric acid gas, carbon monoxide, sulfur dioxide, and oxides of nitrogen. He also made the first soda drink.
- March 16, 1834 In 1873, Hermann W. Vogel, born on this date, invented the orthochromatic photographic plate. He designed a photometer and was a researcher in spectroscopic photography.
- March 19, 1883 Birthdate of Walter N. Haworth, who synthesized ascorbic acid (Vitamin C) in 1933. He did research on sugars and dextran as blood plasma substitute. He received the Nobel Prize in 1937 for his investigations on carbohydrates and vitamin C and shared it with Paul Karrer, who received the award for his investigations on carotenoids, flavins and vitamins A and B2.
- March 24, 1494 Birthdate of Georgius Agricola, the “Farther of Mineralogy,” who described mining and metallurgical processes.
- March 27, 1861 Birthdate of Nikolai Y. Demjanov, who was researcher on decomposition of aliphatic diazonium ions and the Demjanov-Tiffeneau rearrangement.
- March 28, 1941 Glenn T. Seaborg and colleagues showed that plutonium 239 undergoes fission by slow neutrons, leading to the plutonium bomb, which was a goal for the Manhattan Project.

Editor's Note: The Chesapeake Chemist is now printing the mailing labels, which used to be sent from the national ACS office. It is important, therefore, that section members notify the newsletter of a change of address. Those of you receiving email versions of the newsletter will be phased out of the postal mailings, and individuals at the same residence will now receive only one copy of the Chesapeake Chemist; we hope you don't mind sharing. Remember the newsletter is always visible on the web at www.towson.edu/~sshah.

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