

THE OCTAGON



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Lehigh Valley Section of the American Chemical Society

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760th LVACS Meeting:

Date: Tuesday, November 19, 2002

Location: Lehigh University

Reception: 5:15 Asa Packer Dining Room, 29 Univ. Center

Dinner: 6:15 Asa Packer Dining Room, 29 Univ. Center

Menu: Choice of Lime Marinated Flank Steak with Chipolte Honey Sauce OR Sauteed Chicken Breast Tossed with Tomatoes, Mushrooms, Shallots. Chef's Vegetarian (available on request). Served with salad, vegetable, pasta, rolls, and dessert.

Meeting: 7:30 Neville 1

Cost: \$20 members and guests, students \$10

Contact: Connie Bovee, clb7@lehigh.edu, (610)758-347.

Please provide name, affiliation, phone number, and entrée choice by 5:00 PM, Wed. Nov. 13

Directions: Please see the website for complete directions and a campus map.

<http://www.esu.edu/lvacs/meetings.html>

Speaker: Peter C. Jurs, Ph.D.

Talk: " Prediction of Chemical and Biological Properties of Organic Compounds from Molecular Structure "

Peter C. Jurs is Professor of Chemistry at The Pennsylvania State University. Jurs received his B.S. in chemistry from Stanford University, his Ph.D. in chemistry from the University of Washington. He joined the faculty of Penn State University, where he has been Professor of Chemistry since 1978. He has published approximately 250 papers, books, and chapters. Jurs's research interests include the application of computer methods to chemical and biological problems. He has been actively involved in research in structure-property relationship studies including prediction of physical and chemical properties and structure-activity relationship studies of biologically active compounds such as pharmaceuticals and genotoxic compounds.

Abstract: Relationships between the molecular structures of organic compounds and their chemical or biological properties can be investigated using quantitative structure activity relationship (QSAR) methods. This approach uses induction to seek generalities by examining large sets of training set compounds. Such QSAR studies involve three major activities: representation, feature selection, and mapping. Representation involves calculating molecular structure descriptors to encode the compounds. General classes of descriptors include topological, geometrical, electronic, and polar surface area representations of the molecules. Intermediate between representation and mapping is feature selection, which involves selecting the most informative subsets of descriptors from the descriptor pool using statistical methods, simulated annealing, or the genetic algorithm. Mapping involves building mathematical models linking the descriptors directly to the chemical or biological property under investigation. Statistical regression and computational neural network methods are used. After their development from a training set, these models then can be used for predicting the activity of interest for unknown compounds. The capabilities described here have been incorporated into an interactive, user driven software system called ADAPT. Recent investigations involving computational neural networks and genetic algorithms will be described as examples of the application of the QSAR methods. Three-layer, feed-forward neural networks trained with a quasi-Newton method have provided excellent results in several QSAR studies. The genetic algorithm has been shown to be very effective in performing descriptor selection. Several specific, recent QSAR studies will be discussed, including studies of prediction of the aqueous solubilities of organic compounds, the prediction of Tetrahymena toxicity, and prediction of chromosomal aberration potential. ***For a complete biographical sketch and expanded abstract please see the section website.***

LVACS Officers:

Chair: Joe Sherma
Lafayette College, Easton, PA 18042
shermaj@mail.lafayette.edu 610-330-5220

Chair Elect: Paul Bouis
Mallinckrodt Baker Inc., Phillipsburg, NJ 08865
paul.bouis@tycohealthcare.com 908-859-9443

Secretary: Tara Baney
Merck Research Laboratories, Dept. 864,
10 Sentry Parkway, BL1-4, Blue Bell, PA 19422
tara_baney@merck.com 484-344-3346

Treasurer: John Freeman
522 Raub St., Easton PA 18042
jcf2@fast.net 610-923-358

Councilor: Roger Egolf
Penn State LV Campus, Allentown, PA 18051
rae4@psu.edu 610-285-5110

Councilor: Pamela D. Kistler (2000-2001)
Cedar Crest College, Allentown, PA 18104
pdkistle@cedarcrest.edu
610-437-4471 Ext 3507

Alternate-Councilor: T-Michelle Jones-Wilson
East Stroudsburg University
East Stroudsburg, PA 18301
mjwilson@po-box.esu.edu 570-422-3446

Alternate-Councilor: Carol Baker Libby
Moravian College, Allentown, PA 18018
cblibby@cs.moravian.edu 610-861-1629

2002-2003 Meeting Schedule:

(Please *pencil* these dates on your calendar)
September 12, East Stroudsburg University
October 17, Kutztown University
November 20, Lehigh University
January 22, Muhlenberg College
February 20, Lafayette College
March 14, DeSales University
April 15 or 16, Moravian College
May (TBA)

Editors Message:

Thanks for all of the positive feedback about the Octagon. I continue to encourage those of you with web access to take advantage of the email Octagon. Email subscription saves the section money. Did you realize that each issue of the Octagon costs almost \$800 to print and mail? Email distribution is free and it takes just a minute to download the issue (even over my ancient modem!). With email subscription you can get the Octagon 7-10 days earlier than the print version. You receive your information more quickly and in color! If you are unsure how to access a pdf file, there was an article in the October Octagon with the details. Or drop me a line and I would be glad to walk you through the process. If you would like to be an email subscriber, just send me an email at mjwilson@po-box.esu.edu with the subject line - Email Octagon - and I will add your name to the distribution list. Email addresses will remain strictly private. Please visit our website at www.esu.edu/lvac. You will find expanded menus for section dinners and detailed directions to each campus with maps and often parking information. Convenient links to officers' email addresses are also available. As always if you have any information about Chemistry in the LeHigh valley please send it to me for incorporation in the newsletter or the website.

Question of the month

What is dephlogisticated air?

Come to the November Meeting for the Answer!

Local Student Affiliates Recognized!

The Lafayette College and East Stroudsburg University sections of the ACS Student Affiliates have each been awarded an Honorable Mention for chapter activities conducted during the 2001-2002 academic year. The Student affiliates program has a current enrollment of more than 7,500 students and offers them the support, privileges, and benefits of the largest scientific professional society in the world. There are over 950 chapters at colleges and universities in the U.S. and Puerto Rico. Each chapter is required to submit an annual report of its activities. Based on the review of these reports, chapters are selected by the Society Committee on Education for recognition as Outstanding, Commendable or Honorable Mention chapters. For the 2001-2002 academic year, 31 outstanding, 55 commendable and 71 honorable mention awards will be presented. The award winning chapters will be honored at the 225th ACS National Meeting in New Orleans.

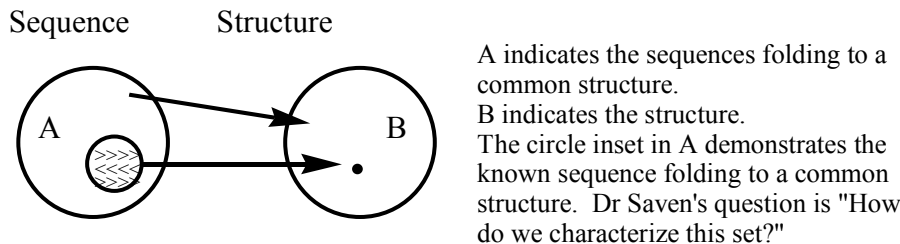
October Meeting Minutes:

The 759th meeting of the LVACS was called to order by Chair Dr. Joe Sherma at 7:40 PM on Tuesday, October 15, 2002. Kutztown University hosted the meeting on their campus. The items discussed prior to the lecture are as follows: Dr. Sherma noted there were two sets of minutes to approve; April 2002 and September 2002. Both were approved, September's had a minor correction that was made prior to the October meeting. Next, the Question of the month was answered: "Name the chemist (born the son of a blacksmith, began his career as a bookbinder's apprentice) who refused the presidency of both the Royal Society and the Royal Institution?" The answer is Michael Faraday. Dr. Michelle Jones-Wilson submitted a brief biography.

Michael Faraday was the son of a blacksmith, and was born at Newington Butts, near London, September 22, 1791. He began life as an errand boy to a bookbinder and stationer, to whom he was later a bound apprentice. After eight years in this business, he was engaged by Sir Humphry Davy as his laboratory assistant at the Royal Institution, and in 1813-15 he traveled extensively on the Continent with his master, and saw some of the most famous scientists of Europe. Shortly after his return to the Royal Institution, he began to make contributions of his own to science, his first paper appearing in 1816. He became director of the laboratory in 1825 and professor of chemistry in 1833, rising rapidly, through the number and importance of his discoveries, to a most distinguished position. He was offered, but declined, the presidency of both the Royal Society and the Royal Institution. He died August 25, 1867.

Next, Dr. Sherma reminded everyone to vote. The deadline to submit your vote is October 31st. Please see the October Octagon for ballot instructions. John Freeman presented the Treasurer's Report. We have \$3,392.73 in our checking account, \$1,548.42 in our scholarship fund, and \$31,572.75 in our investment account. Dr. Sherma noted that October 20-26 is National Chemistry Week, and many local colleges and universities are hosting / participating in events. The recipient of our Foundation in Chemistry award, Natalie Bartow, was in attendance, and spoke briefly about her experiences at Kutztown University so far. Natalie thanked the section and noted the exciting challenges she is encountering while at Kutztown. Prior to the introduction of our speaker, Dr. Sherma noted the November meeting will be Tuesday, November 19th, at Lehigh University. There will be an Executive Committee meeting prior to the main meeting.

Rolf Mayrhofer introduced our speaker for the evening, Dr. Jeff Saven, PhD. The title of Dr. Saven's talk was "Combinatorial protein libraries: approximate approaches to design." Dr. Saven began by introducing us to the University of Pennsylvania and his department. For a more detailed review, see the University's website, <http://www.upenn.edu>. Protein folding is a truly interesting topic to research. Can we, as researchers, take living polymers and lead them to self-assemble into a functioning entity? Dr. Saven noted three main "protein problems:" 1. How do we go from a sequence to a structure? 2. What are the forces and dynamics of folding? Dr. Saven notes there is much activity in this area. 3. How can we identify the sequence from the structure? Dr. Saven's research and talk focused on the third question. Proteins have special processing properties, and Dr. Saven described a key few. He noted that biopolymer properties include self-assembly, straightforward synthesis, & genetic manipulation capabilities. Can the same be said for non-biopolymers? To try to answer that, Dr. Saven illustrated biopolymer sequence degeneracy.



There are 20^N possible sequences from this scenario, and even through computational methods, this is a daunting task to decipher all the permutations and combinations. Why do these analyses? Dr. Saven explained several reasons, such as understanding biological and molecular evolution, variability, to improve methods for databases, to find what possibilities exist with amino acids, as well as combinatorial possibilities. The applications include genomic research, protein-based therapeutics, a tool for better understanding molecular self-organization, and the potential of expanding this to non-biopolymer systems. Next, Dr. Saven discussed some problems with this system, one major issue being similar folding with little sequence similarity. Also, there exist a huge number of sequences to review, a complicated kinetic process, the largely non-covalent stability interactions, and the fact that naturally occurring molecules are marginally stable. Two methods for designs are basic

inspections and computational methods. Dr. Saven explained inspection is a relatively good method to use, for example placing hydrophobic and hydrophilic residues in appropriate places based upon the folding pattern seen in the structure. The computational methods are also good, examining numerous structures at one time, using a "fixed target structure" as a baseline. This target has a specific score or energy, and is used to design proteins that fold to those criteria. Those proteins are then synthesized and analyzed by NMR. Dr. Saven noted the difficulties with such a directed protein design. There are a large number of degrees of freedom due to the multiple side-chain orientations. The goal is to look at a small number of sequences, and to optimize the structures. Not only is the end result to have a structure/sequence correlation, but the protein should function as well! Dr. Saven explained to attempt minimization of these difficulties, his lab uses partial information from databases to guide the design of the sequences. The target number of sequences is 10^4 to 10^{11} ; this range is relatively easy for a computer to analyze and sort.

Next, Dr. Saven illustrated that the proteins can be synthesized by either solid phase synthesis or using molecular biological techniques. He also detailed two experiments showing fairly successful results. In addition, he spent some time explaining that in order to estimate the number of sequences satisfying the desired characteristics of the structure, a set of constraints must be in place so this number is manageable. The entropy, S , is minimized at a fixed energy, E , and he gave a number of examples to that effect. If one specifies the constraints (lower S), the smaller the number of possibilities - 20^N will become more like 10^0 to 10^{11} . In addition, constraints such as each site must be occupied, specifying E , the number/types/pattern of amino acids, etc. will enable a more manageable set of data to analyze. Dr. Saven explained the way this is tested is through Lattice Models. These are well defined and studied structures that have minimal interactions. In addition, this model can be easily used by computer software. Dr. Saven then showed numerous graphs and pictorials as evidence that theoretical and exact results of realistic models and proteins agree very well.

Lastly, Dr. Saven explored comparisons of theoretical versus structures in current databases to look at conserved and non-conserved sites. He noted there are many reasons for conservation of amino acids, such as stability, timing of folding, cellular processing, and functions like catalyst and binding/molecular recognition. He then displayed numerous examples of soluble proteins and noted the good and bad agreements between theory and database. As a summary, Dr. Saven mentioned possibilities of this process for membrane proteins, and experimenting with non-biological systems, such as non-natural side chains, polyamides, and hydrocarbon backbones.

After his talk, Dr. Saven answered many questions, and was presented with gifts to express the section's appreciation. The meeting was adjourned at 8:52 PM.

Respectfully Submitted,

Tara S. Baney, Secretary, LVACS, 17-October-2002

2002-2003 ACS ProSpectives Conferences

ProSpectives conferences are small, focused conferences tailored for industry scientists who want to meet and hear from the field's foremost scientists, and to interact with peers.

Process Chemistry in the Pharmaceutical Industry:

Kumar Gadamasetti, X-MINE; Mike Martinelli, Eli Lilly, Condado Plaza Hotel San Juan, Puerto Rico February 2-5, 2003

Polymorphism in Crystals: Fundamentals, Prediction, and Industrial Practice

Robin Rogers, The University of Alabama; Allan Myerson, Illinois Institute of Technology; Susan Reutzel-Edens, Eli Lilly; Roger J. Davey, UMIST (United Kingdom) Saddle Brook Resort, Tampa, Florida February 23-26, 2003

The state-of-the-art in the often misunderstood field of crystalline polymorphism will be presented by leading experts in polymorph characterization and prediction, with an emphasis on industrial applications and practice.

Catalysis in Modern Organic Synthesis

Stephen Buchwald, MIT; Gregory Fu, MIT; Eric Jacobsen, Harvard Cambridge Marriott Cambridge, MA March 2-5, 2003

Catalytic methodologies for organic synthesis, a special emphasis on technologies with applications in pharmaceutical science.

Chemical Genomics (tentative)

Sheila DeWitt, ArQule, Date/Location: To Be Determined

Integrating Proteomics into Systems Biology (tentative title)

Ruth Van Bogelen, Pfizer, Lansdowne Conference Center November 10-13, 2003 (tentative dates)

ADME/TOX (tentative) Rod Cole, Millennium Pharmaceuticals, Date/Location: To Be Determined

For additional information: www.acsprospectives.org 1.800.227.5558; 202.872.6286

This Month in the History of Chemistry:¹

November 1: *Antoine Lavoisier reported to the French Academy of Sciences that sulfur and phosphorus gain weight upon heating, 1772. Lavoisier's further research into the matter would change the way chemists viewed combustion.

*First detonation of a thermonuclear fusion bomb (H-bomb) at Elugelab Atoll, Marshall Islands, 1952.

November 2: DuPont begins mass-production of the first commercially available synthetic rubber, Du Prene, in 1931.

November 3: *American Association of Textile Chemists and Colorists founded, 1921.

*Carlton E. Schwerdt announced crystallization of poliomyelitis virus at University of California, 1955.

November 4: *William Hyde Wollaston presented his "synoptic scale of equivalents" to the Royal Society, 1813.

*X-10 fission reactor, the first to produce large amounts of radioisotopes for further research, goes critical at Oak Ridge, 1943.

November 8: *Wilhelm Röntgen discovers X-rays, 1895. Read his first report of X-rays.

November 9: *Thomas Drummond heats a ball of lime in front of a reflector, 1825. This first practical use of limelight leads to improvements in theater and lighthouse lighting.

*Element 110 created (3 atoms) at GSI, Darmstadt, Germany, 1994.

November 11: *Discovery of cosmic rays announced, 1925, in Madison, WI.

*Glenn Seaborg announced discovery of americium (Am, element 95) and curium (Cm, 96) on the Quiz Kids radio program, 1945.

November 12: *John Dalton announced the first example of the law of multiple proportions in 1802

*Antoine Lavoisier described to the French Royal Academy of Sciences in 1783 experiments that show water to be a compound, not an element.

November 15: *Carl Gassner, Jr. receives US patent 373,064 for a dry cell battery, 1887

*Humphry Davy names chlorine (Cl, element 17), 1810. Chlorine had been called oxymuriatic acid.

November 19: *Humphry Davy announced the isolation of sodium (Na, element 11) and potassium (K, 19) to the Royal Society, 1807.

November 22: *The Manned Spacecraft Center (now the Johnson Space Center) announced a process to extract water and oxygen from moon soil, 1970.

*Dmitri Mendeleev stated that gallium (Ga, element 31) is identical to eka-aluminum, 1875.

November 24: *Publication of Charles Darwin's seminal work on evolution, *On the Origin of Species*, 1859. Not a chemistry event, but surely an epochal event in science.

November 26: *Charles Hatchett announced discovery of columbium (niobium, Nb, element 41) Royal Society, 1801.

November 28: *First pure compound of berkelium (Bk, element 97) announced, based on work at the University of California, Berkeley, 1962.

*Antoine Lavoisier gives himself up to the revolutionary French government, 1793. He would be imprisoned until executed by the guillotine the following year.

*Alfred Nobel obtains a patent for smokeless gunpowder, 1887.

November 30: *Chlorotetracycline, a broad-spectrum antibiotic, was isolated by Benjamin M. Duggar at American Cyanamid (now part of BASF Agricultural Products), 1948.

¹Thanks to Carmen Giunta, for his Classic Chemistry website <http://webserver.lemoyne.edu/faculty/giunta/>

Tenure Track Organic Chemistry Position

Penn State Abington, located in a suburban setting 15 miles north of center city Philadelphia, offers a small college environment within a major research university. We value and reward innovative teaching and learning and support scholarly research within and across academic disciplines. Current enrollment is 3200 undergraduates in one of more than 160 majors available at the university or in one of the eleven majors offered by Abington College. We seek applicants for tenure track positions in: CHEMISTRY: The ideal candidate will have expertise in both organic and biochemistry. Teaching responsibilities will include organic chemistry lecture, organic and freshman general chemistry labs, and biochemistry lecture and lab courses. Research with bio-chemical applications is preferred. Contact Paul Hutta, Head, Division of Science and Engineering; 1600 Woodland RD; Abington PA 19001 or send CV and supporting material as an email attachment to phutta@psu.edu. Applicants should present a record of effectiveness in teaching, research, and scholarly activity. Key considerations are a commitment to undergraduate education and a willingness to serve the College and the community. Terminal degree in-hand is required for appointment at the assistant professor level or a rank commensurate with qualifications. Applications should include a full curriculum vitae, academic transcripts, statement of teaching philosophy and research interests, and the names, addresses (including e-mail if possible), and phone numbers of at least three references. Official placement dossiers will also be accepted. Send materials to Penn State Abington, Box OHRWEB, 1600 Woodland Road, Abington, PA 19001. Review of applications will begin immediately and will continue until the position is filled. Learn more about Penn State Abington at www.abington.psu.edu

Historical Letters

(Benjamin Franklin (1706-1790) from a letter to Joseph Priestley, 1774 [from Harlow Shapley, Samuel Rapport, & Helen Wright, eds., *A Treasury of Science* (New York: Harper & Brothers, 1943)

In compliance with your request, I have endeavoured to recollect the circumstances of the American experiments I formerly mentioned to you of raising a flame on the surface of some waters there. When I passed through New Jersey in 1764, I heard it several times mentioned, that, by applying a lighted candle near the surface of some of their rivers, a sudden flame would catch and spread on the water, continuing to burn for near half a minute. But the accounts I received were so imperfect, that I could form no guess at the cause of such an effect, and rather doubted the truth of it. I had no opportunity of seeing the experiment; but, calling to see a friend who happened to be just returning home from making it himself, I learned from him the manner of it; which was to choose a shallow place, where the bottom could be reached by a walking-stick, and was muddy; the mud was first to be stirred with the stick, and, when a number of small bubbles began to arise from it, the candle was applied. The flame was so sudden and so strong, that it caught his ruffle and spoiled it, as I saw. New Jersey having many pine-trees in many parts of it, I then imagined that something like a volatile oil of turpentine might be mixed with the waters from a pine-swamp, but this supposition did not quite satisfy me. I mentioned the fact to some philosophical friends on my return to England, but it was not much attended to. I suppose I was thought a little too credulous.

In 1765, The Reverend Dr. Chandler received a letter from Dr. Finley, President of the College in that province, relating the same experiment. It was read at the Royal Society, November 21st of that year, but not printed in the *Transactions*; perhaps because it was thought too strange to be true, and some ridicule might be apprehended, if any member should attempt to repeat it, in order to ascertain, or refute it. The following is a copy of that account.

"A worthy gentleman, who lives at a few miles distance, informed me, that in a certain small cove of a mill-pond, near his house, he was surprised to see the surface of the water blaze like inflamed spirits. I soon after went to the place, and made the experiment with the same success. The bottom of the creek was muddy, and when stirred up, so as to cause a considerable curl on the surface, and a lighted candle held within two or three inches of it, the whole surface was in a blaze, as instantly as the vapour of warm inflammable spirits, and continued, when strongly agitated, for the space of several seconds. It was at first imagined to be peculiar to that place; but upon trial it was soon found, that such a bottom in other places exhibited the same phenomenon. The discovery was accidentally made by one belonging to the mill."

I have tried the experiment twice here in England, but

without success. The first was in a slow running water with a muddy bottom. The second in a stagnant water at the bottom of a deep ditch. Being some time employed in stirring this water, I ascribed an intermitting fever, which seized me a few days after, to my breathing too much of that foul air, which I stirred up from the bottom, and which I could not avoid while I stooped, endeavouring to kindle it. The discoveries you have lately made, of the manner in which inflammable air is in some cases produced, may throw light on this experiment, and explain its succeeding in some cases, and not in others.

ACS MEMBER BENEFITS . . .

Being a Member is the right MOVE!

Being a member of the American Chemical Society means you benefit. Allied Van Lines has partnered with ACS to give you, the member, discounts on your next move. Allied offers reduced cost for moving services, relocation discounts for family members and quality service for local, interstate and international relocation and storage needs. Call your designated Bayshore point of contact at 1-800-874-6683 and ask for an ACS Coordinator.

A NEW Benefit for You!!

The American Chemical Society announces its newest benefit for you the member. We are excited that we can offer you discounts on your next stay at any of the following hotels; Ameri-Host, Days Inn, Knights Inn, Ramada Inn, Travelodge, Villager and Wingate Hotels. Take a minute and call 1-877-670-7088 to make your reservation, or call the hotel directly, mention the Society's discount #62871 and receive up to 20 percent off your next visit at any of the previously mentioned hotels.

Take advantage of reduced rates on your next rental car!

When it comes to member benefits. ACS and Avis "Try Harder" by offering low, competitive daily rates along with special discounts for both leisure and vacation rentals. Most Avis rentals come with free unlimited mileage, too! You'll appreciate the many convenient airport locations and timesaving services, like Avis Express and Roving Rapid Return, that can make renting and returning and Avis car fast and easy. For more information and reservations, call your travel consultant or an employee-owner of Avis, toll free: 1-800-879-2847 or visit www.avis.com. And be sure to mention your Avis Worldwide Discount (AWD) number B120700.

ACS Members receive a world of benefits!

As a member of the American Chemical Society, you can receive reduced rates on your next rental car at Hertz. Hertz offers special membership savings on your business and leisure rentals. And the name Hertz means more service in more places all around the world. To receive your membership savings, use your Hertz CDP# 0083855 when making a reservation. Then present your membership card for identification at the time of rental. For reservations, call your travel agent, call Hertz at 1-800-654-2200 or visit Hertz at www.hertz.com.

National Car Rental: Your membership in the American Chemical Society allows you to receive up to 15 percent OFF of your next auto rental with National Car Rental. Present your membership card and/or a program discount coupon and mention discount #5130201 to receive this reduced rate. Feel free to utilize this benefit whether for business or pleasure. For reservations, call National Car Rental at 1-800-227-7368 (U.S), or 1-800-227-3876 (Non-US).

Membership has its privileges!

ACS, in cooperation with MBNA, offers you a superior credit card program, one that has become the standard of excellence—the standard by which all other credit cards are measured. Now you can enjoy the highest level of service and quality with the American Chemical Society Platinum Plus Master Card credit card issued by MBNA America Bank. The Platinum Plus credit card carries no annual fee and provides you with a low introductory 1.7 percent APR on cash advance and balance transfers. For more information or to get your new Platinum Plus credit card, call MBNA toll free at 1-800-932-2775

ACS Expeditions

ACS Expeditions, sponsored by Betchart Expeditions is also a recent addition to our member benefits. ACS Expeditions offers great trips and learning experiences for the intelligent traveler. Our co-sponsorship with Betchart offers something very few travel programs can: trips to exotic places led by knowledgeable experts—naturalists, archeologist, or anthropologists—who can provide you with insights into your experiences. The groups are small, so there is plenty of opportunity to ask questions and set your own pace for exploration. The locales are unique, not the standard tourist fare, for those who want to enjoy a once-in-a-lifetime experience rather than just a vacation. These trips are a treasure trove of memories and special moments. Betchart Expeditions has been leading vacationers to the less-traveled parts of the world for two decades. For a detailed brochure and more information, contact ACS/Betchart Expeditions at 1-800-252-4910 or 1-408-252-4910.

Cycling and Walking Tours in Europe

Imagine yourself in France. You're cycling along the beach in Normandy and Brittany, stopping in tiny harbor towns on your way to Omaha Beach and Mont St. Michel. Or perhaps you'll be waking in Provence, staying in exclusive Provencal villages and exploring the area's rich Roman and pre-Roman antiquities. The choices don't end there; in fact, that's just the beginning. Because so many people are interested in active vacations, ACS is proud to offer members a 5 percent discount on more than 70 deluxe biking and walking tours with the leading company in active European travel, Euro-Bike and Walking Tours. Here's a chance to travel on quiet traffic-free roads and pathways known only to the locals, visit Europe's most impressive sights and out-of-the-way treasures, taste fine wines from world-famous vineyards, stay in luxury hotels, dine on fine regional cuisine, and meet the locals. Traveling 25-35 miles per day on bike tours and 6-8 miles per day on walking tours, you'll be encouraged to go at a leisurely pace. There's plenty of time to walk under waterfalls, tour a cave with pre-historic paintings, or visit the colorful shops. Best of all, the tours are fully supported, so all you need to do is enjoy yourself and let the experienced English-speaking guides transport your luggage and take care of the details. They'll also offer a lift in the van when you want one and provide you with information about the routes, towns, and sights along the way. These exciting vacations are offered in 14 countries: Austria, Belgium, Denmark, England, France, Germany, Holland, Hungary, Ireland, Italy, Luxembourg, Sweden, Switzerland, and new this year the Czech Republic. The company carefully researches each route to offer the best scenery, sightseeing, and local color available. Here's a sampling of their destinations: the Italian Lakes, Bavarian Alps, Islands of Scandinavia, Tuscany, southwest Ireland, Germany's Romantic Road, England's Cotswolds, Burgundy, Loire, and Alsace. All tours feature luxury accommodations and gourmet cuisine from the area. Travel through varying landscapes and terrain: each tour is rated from easy to challenging. People with varying levels of ability are welcome. Euro-Bike and Walking Tours has been leading active vacations in Europe for 28 years, offering scheduled departures from April to October with specialty tours for beginners, singles and solos, private groups, and families. When you sign up, provide your ACS membership number, and all members of your party will receive 5 percent off the tour price. For more information or a full color brochure contact Euro-Bike and Walking Tours at 1-800-321-6060, fax 1-815-758-8822; email info@eurobike.com, or on the web at www.eurobike.com.