Department of Chemistry Newsletter
University of Pittsburgh

GREETINGS FROM THE CHAIR

I hope that this newsletter finds you well and prospering. I am writing to share news about important changes for the Department this past year, in terms of both people and infrastructure.

The newsletter this year attempts to help you appreciate that the Department is more than number of students, buildings, credit hours, and research dollars. Rather, it is about people pursuing their goals and realizing their dreams. Hence we present news/updates from alumni (see pages 2 and 12), and vignettes of an alumnus (see page 3), students (see pages 4 and 5), and faculty (see pages 8 and 10).

This year we saw both gains and losses to faculty. While many universities retreated on the recruiting front, we moved forward actively and hired three junior faculty (see page 10). Dr. Seth Horne, an organic/biological chemist, and Dr. Renã Sowell, an analytical/biological chemist, were each hired as tenure-stream assistant professors. Dr. Michelle Muscatello (Pitt PhD 2009) was hired as a lecturer in charge of our analytical and instrumental labs. Also, I am very pleased to report that Scott Nelson and Adrian Michael were each promoted to full professor during this past year. Sadly, we lost two colleagues, Professor Peter Siska and Emeritus Professor Johannes Coetzee, during the past year. Both of these colleagues were dedicated to the Department and its success for many years. Efforts are underway to create memorial funds in their honor (see page 11).

Although the fiscal crisis has slowed our efforts to modernize and renovate the Department facilities, we have continued to move forward. In August of 2009, the new research laboratories on the 14th floor became available and are currently occupied by the Floreancig, Horne, and Wilcox groups. The new labs have a 'ballroom' design in which the entire space (ca 6000 sq ft) is open and contiguous; a dramatic departure from the canonical Chevron structure of a central corridor from which individual laboratory bays have a 10 foot by 30 foot area. It is hoped that this new design will allow more efficient use of space and foster more collaboration among researchers. Extensive planning has proceeded for renovation of the 5th floor and the construction of an annex above Ashe Auditorium (see the artist's rendering on page 7). At this time funds (circa $30 M) have been allocated for the Ashe annex, however funding for the 5th floor has not yet been released. During the past summer the first floor classrooms in Chevron were renovated, and work is currently being performed on creating a 21st century Chemistry 'library' in the front of Chevron, thus freeing up the existing library's space in Eberly Hall to be used for research labs. Lastly, work is nearly complete on a coffee/snack shop (named the "Bunsen Brewer" by popular vote of our current chemistry majors) that will be located in the Chevron lobby, near the new library.

The Department's student body is growing in both number and quality. Last year we graduated 67 BSc chemists, and the number of our undergraduate majors has grown dramatically, from 215 five years ago to 455 at the present. The Department awarded 26 PhD and 12 MSc degrees this year and has over 200 graduate students and 35 postdoctoral associates in residence. Our efforts to recruit the best and brightest BSc chemists into the graduate program received considerable new resources this past year in the form of fellowships, from the Bayer Foundation and from the School of Arts & Sciences. These resources and a strong cadre of active faculty, both junior and senior, provide two of the essential ingredients for success. As we move forward it is important to share the successes of our graduates with current students, and I hope that you will take some time to share news about yourself with the Department by filling out the enclosed card.

I look forward to hearing from you in the coming year.

David H. Waldeck

Issue 6
Fall 2009

In This Issue

Faculty 1969

W. Edward Wallace, Chairman

Edward McCollin Arnett
Professor, Organic Chemistry
Richard A. Butera
Associate Professor, Physical Chemistry
James Clyde Carter
Associate Professor, Organic Chemistry
Toby M. Chapman
Assistant Professor, Organic Chemistry
Johannes Francois Coetzee
Professor, Analytical Chemistry
Theodore Cohen
Associate Professor, Organic Chemistry
Raymond S. Craig
Professor, Physical Chemistry
Samuel J. Danishefsky
Assistant Professor, Organic Chemistry
Bodie E. Douglas
Professor, Inorganic Chemistry
Paul Dowd
Assistant Professor, Organic Chemistry
Malcolm F. Dull
Associate Professor, Organic Chemistry
Administrative Officer
T.H. Dunkelberger
Professor, Physical Chemistry
Assistant Dean, College of Arts and Sciences
Frank Oscar Ellison
Professor, Physical Chemistry
Lawrence M. Epstein
Associate Professor, Physical Chemistry
Henry S. Frank
Professor, Physical Chemistry
Claibourne Eugene Griffin
Professor, Organic Chemistry
Klaus H. Hofmann
Professor, Biochemistry
Director of Protein Research Lab
Charles Alvin Hollingsworth
Professor, Physical Chemistry
Kenneth Jeffrey Johnson
Assistant Professor, Computer Applications in Chemistry
Frederick Kaufman
Professor, Physical Chemistry
Robert Levine
Professor, Organic Chemistry
Richard Hugh McCoy
Professor, Biochemistry and Associate Dean
Director of Graduate Programs, Faculty of Arts and Sciences
Foil A. Miller
Professor, Physical Chemistry
Director, Spectroscopy Laboratory
Alfred Leon Moyé
Assistant Professor, Inorganic Chemistry
David Wixon Pratt
Assistant Professor, Physical Chemistry
Jerome L. Rosenberg
Professor, Physical Chemistry
Hurd Winter Safford
Professor, Analytical Chemistry
David Philip Schumacher
Assistant Professor, Physical Chemistry
Darel K. Straub
Associate Professor, Inorganic Chemistry
Joseph J. Taber
Associate Professor, Physical Chemistry
Administrative Officer
William Edward Wallace
Professor, Physical Chemistry
Chairman
Claude Edwin Wilson
Assistant Professor, Analytical Chemistry
Robert L. Wolke
Professor, Nuclear Chemistry

Class of 1969: Where are they now?

What a year 1969 was. Richard Nixon was inaugurated as President and Neil Armstrong became the first person to walk on the moon. The Pirates came in 3rd in the National League with a winning record (My, how some things change!). Carnegie Mellon University held a conference on high-speed ground transportation (Some things never change). At Pitt, the Black Action Society held its first demonstration, blocking the Chancellor's office and staging a "lock-in" in the computer center. Pitt football had just completed three seasons with only a single win each season. David Pratt had just joined the Chemistry Department. The class of '69 was there at the beginning when the University transitioned from a private school to its current state-related status (1966), leading to the sustained growth in size and stature that continues to this day.

Carol L. Buffenmyer (BSc 1969; Advisor: Yee): Carol began her career in 1962 as a research technologist at Conemaugh Valley Memorial Hospital; in 1969 she received a BS in Chemistry and worked as a research assistant at the Dental School at Pitt. She received a MSc in 1973 and worked as an infection control officer at Magee-Women's Hospital. In 1990 she began working as a medical technologist at the American Red Cross Blood Services until she retired in 2000. (buffenmyerel@aol.com)

Meredith (Matthews) Clayton (BSc 1969; Advisor: Rosenberg): Meredith is a Chemistry teacher in the Lake Washington School District. In 2005 she achieved the National Board for Professional Teaching Standards certification in Adolescent and Young Adult Science (specialty area Chemistry). She is presently trainer/scoring director for assessment of the 2009 portfolio entry. (mclayton@lwsd.org)

Sharon Marion D'Orsie (BSc 1969; Advisor: Chapman): "It's my time to "give back" and grow a new generation of scientists and engineers. After selling my company, I went back to teacher's school. I am now certified to teach chemistry and physics (which I do). I am working on my mathematics certification. And, I get to live in Maine which is one of the most beautiful spots on earth. Life is good." (smdorsie@gmail.com)

Charles R. (Charlie) Gibbs (MSc 1969; Advisor: Cohen): Charlie is semi-retired after various positions ranging from industrial R&D, marketing, and advertising to plant nursery owner and real estate development. He is now involved in kiln-casting glass art and welcomed his first grandchild last year! (charliegibbs19@gmail.com)

John G. Kokales (BSc, 1969): John obtained an MD in 1973. He is now married to Arlene and has one son, David. John is a clinical Associate Professor of Medicine and Medical Director of the UPMC health plan and practices internal medicine at Solano, Kokales & Associates (UPMC). (kokalesjg@upmc.edu)

Lou Komis (BSc, 1969): Lou recently retired from PPG industries and moved to a remote mountain range where he flyfishes the rivers daily—no email, no twitter, no facebook, no hassles.

Leonard D. Kowalczyk (BSc, 1969; Advisor: Safford): Married to Rosemary in August 1969. "I worked in the chemical industry for 36 years with 3 companies: Shell, Huntsman Corp, and Johnson Matthey Pharmaceuticals. My job titles ranged from Quality Assurance Rep to Laboratory Manager to Senior Chemist. My career took me from New Jersey to California to Ohio and back to New Jersey. I retired in September of 2005 and settled back home in Western PA in the small town of Portage. I enjoy gardening, winemaking, golf and my 5 beautiful grandchildren. Hail to Pitt!" (roskow832@comcast.net)

Margaret Matthews Rich (PhD, 1969; Advisor: Griffin): Professor and Chair of the Department of Natural Sciences and Applied Technology at Cape Cod Community College. (mrich@capecode.edu)

Paul Rupert (PhD 1969; Advisor: Griffin): In addition to his position at Adrian College (Professor of Chemistry), he owns and operates a commercial wine laboratory and has been designated a Certified Wine Chemist by the US Department of the Treasury – Tobacco and Alcohol Tax and Trade bureau. (prupert@tc3net.com)

Harry J. Silvis (BSc 1969): CEO at Washington Internal Medicine; received MS in 1971 from the Illinois Institute of Technology, married to Nancy in June 1975; MD in 1975. Three children, Harry Jr., Ryan, and Matthew; three grandchildren, Jack, Harry III, Andrew. (hjsilvis@comcast.net)

Richard Stein (PhD 1969; Advisor: Butera): Vice-President, Quick Protective Systems; recently received large military order for chemical/biological protective hood. (qmask@yahoo.com)

Robert Stein (BSc 1969; Advisor: Rosenberg): MBA, Pitt 1973. (rks2247@aol.com)

Andrew Ward (BSc 1969; Advisor: Douglas): Retired in 1999; 14 US patents in organosilicon chemistry. (ahward60@hotmail.com)

Larry B. Wingard (BSc, 1969): Received MBA in 1974 and currently at Armstrong County Memorial Hospital as a Hospitalist/Internist; Director – Armstrong County Memorial Hospitalist program, married to Karen (Miller) Wingard; three children, Laura, Jeremy (2nd yr. Resident at UPMC in ophthalmology; Emily.

John F. Wurster (BSc, 1969): Received MBA in 1974 and is currently President of Orion Issues Management, Inc. which commercializes new environmental technologies; married 40 years to a Pitt Pharmacy graduate; two married sons; two grandsons. "Living the great life in Colorado." (jfwurster@comcast.net)

Jonathan Nicholas Zelnik (BSc, 1969): Received MD in 1973 and recently retired as Regional Chief of Plastic Surgery from the Permanente Medical Group of Northern California after 27 years. Dr. Zelnik is currently living in the wine country north of San Francisco where he built a house on mountain acreage overlooking Sonoma Valley wineries. "I am in the process of developing my art skills with formal training." (jonzelnik@hotmail.com)

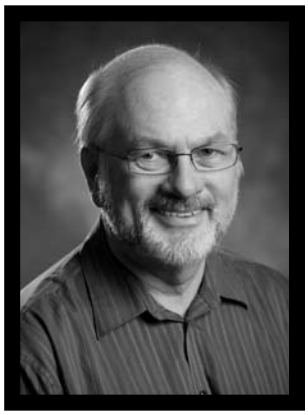
Outstanding Alumni

Vincent M. Donnelly Professor, Department of Chemical Engineering, University of Houston

Glossy high speed computers and other electronics are a part of everyday life. But without semiconductor processing, an iPod would not be more than an elegant plastic case. Pitt alumnus Vincent Donnelly is one of the key developers of plasma processing and etching, making this technology possible and modern life easier.

"I had the opportunity to work on my PhD at Pitt with Fred Kaufman, which was an incredible opportunity," says Donnelly. "We worked on spectroscopy and kinetics problems, which provided me with a nice foundation. And I had some interesting experiences, including collaborating with NASA on a joint Apollo mission with the USSR. Most importantly it also whetted my appetite for research and attacking problems." At the time, Kaufman's group was at the epicenter of research initiatives to study the reactions involved in ozone depletion. "We developed the models that demonstrated what a serious problem the release of chlorine in spray cans was causing in the environment," adds Donnelly. Donnelly's own detailed and painstaking research opened the door on another intricate problem, the way a polyatomic molecule disposes of energy it has received, for instance by absorption of a pulse of light delivered by a laser.

After completing post-doctoral work, Donnelly began working at the prestigious Bell Labs and delved into intensive semiconductor processing and plasma processing/etching research. "This process is used in the manufacture of integrated circuits. Circuits are manufactured layer by layer. The layers are initially delineated on a wafer; however, that layer cannot function and needs to be transferred using plasma etching," continues Donnelly. "And with that etching process it points the way to more efficient manufacturing processes." During his 21 years at Bell Labs, Donnelly also had the opportunity to work on compound semiconductor lasers and protectors – things that are critical to data transmission over high speed lines. In addition, he spearheaded new diagnostic techniques to monitor and control plasma processes, therefore leading to less damage to the wafer during manufacturing.



After leaving Bell Labs, Donnelly accepted a position with the University of Houston, where he is currently the graduate director in chemical engineering, as well as teaching one class a semester and continuing his work in plasma research. "I continue to find plasma processing research fascinating," concludes Donnelly. "The circuits continue to get smaller, which is an interesting physical phenomenon – with a nanofabrication regime we control patterning to the sub-ten nanometer dimension. Yet, at the same time, I'm still just trying to understand the basic plasma chemistry and physics."

CONGRATULATIONS:

Arun Ghosh (PhD, 1985; Advisor: Kozikowski). Arun Ghosh, a Distinguished Professor of organic and medicinal chemistry at Purdue University, will receive the Arthur C. Cope Scholar Award at the ACS fall national meeting. Dr. Ghosh, who has been at Purdue since 2005, is noted for his accomplishments in the areas of drug design, chemical synthesis of natural products, and development of new reactions and structure-based design of enzyme inhibitors. Arun received his PhD from the Department in 1985 under the guidance of Professor Alan Kozikowski. Arun not only earned his doctorate at Pitt but also his marriage certificate. He met his wife Jody in the Department; she received her Master's in organic chemistry before going on to medical school. They have three children.

CALL FOR NOMINATIONS

The Department is soliciting nominations for *Chemistry Department Alumni Awards*. Nominees should have a bachelor's, master's or doctoral degree from the Department. The basis for the nomination can be excellence in research, teaching, management, or volunteer efforts. Nominations should include:

1. Your nominating letter

2. At least one but no more than three seconding letters

3. A CV for the nominee

4. Contact information for the nominee

Please see the alumni section of our Web page at http://www.chem.pitt.edu for more information
Nominations should be posted by December 1, 2009 to:
Assistant Chair
Dept. of Chemistry
University of Pittsburgh
Pittsburgh PA 15260

2008 Undergraduate Senior Awards

The American Institute of Chemists Award
Brandon M. Mills

The Mary Louise Theodore Prize
Rachel C. Botham
David M. Hanna
Nathaniel J. Mohney
Brianna C. Rossiter
Andrew J. Slivosky
Courtney A. Valko

The Merck Award
Kanika Gupta
Nathaniel J. Mohney

The SACP College Award
Devin E. Potts

The Silverman Prize
Mary Ellen Lisman

The Phillips Medal
Matthew L. Dawson

Undergraduate Highlights: Devin Potts

On April 26, 2009 we celebrated the academic achievements of 67 undergraduates who received their Bachelor of Science degree in Chemistry over the past year. We congratulate all of them on their accomplishments! One member of this special group is Devin E. Potts. Devin graduated in April with both Departmental and University Honors and a Communications Option degree. During his time with us, Devin carried out undergraduate research under the direction of Professor Toby Chapman where he looked at "Sequestering Carbon Dioxide with Polymers Containing Ionic Liquid Moieties".

Devin was involved in our undergraduate teaching program. He led recitation sections for several of our organic chemistry classes. He also organized and judged the first student poster session for our organic chemistry course that is specially designed for students in the School of Health and Rehabilitation Sciences.

Devin was involved in our ACS-SA. He served as newsletter editor for two years and gave much of his own time through volunteer efforts with our many outreach programs including the Saturday Science, Honors Organic, and Good Shepherd-Braddock programs.

In addition to these accomplishments, Devin also spent a term as part of a Study-Abroad experience in Cyprus - an experience that has had a major impact on his life and goals. Devin is currently part of the Teach for America Program and he will spend the next two years sharing his own love of chemistry and education with students who live in inner city Philadelphia.

Once again, congratulations to Devin and all of our graduates. You have helped to make our Department a very special place and we wish you continuing success in the future.

ACS Student Affiliate News

The ACS-SA has been a key force in the Chemistry Department, offering services such as free tutoring, access to interesting speakers, and information that can lead to a career. While continuing these efforts, we will increase emphasis in other areas. One initiative is to better promote the ACS-SA by making the information about ACS more available to students in a formal manner, rather than relying on word of mouth. We would also like to make research opportunities in the Department more transparent for students interested in broadening their presence in the Department. We plan to continue to host interesting and engaging speakers who can share their knowledge about opportunities after college, but we also hope to find speakers to address the general college community in a more public forum so that non-ACS members can benefit.

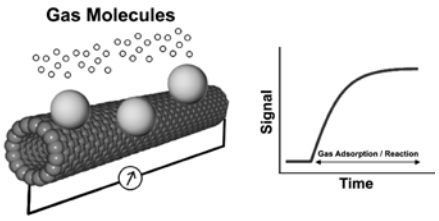
Community outreach is something the ACS has made a priority. Last year, Saturday Science did not happen in the second semester much to the dismay of many members who love the program. We would like to continue doing Saturday Science, building on the foundation from last fall, and we would like to create more programs that inspire and nurture the interest of young people in science.

Another goal for the year is to increase interactions with other clubs and groups on campus. We will extend invitations to biology, physics, engineering and other clubs to sponsor combined events, come to hear our speakers, or begin some friendly competition with them. We would also like to work with groups such as the Residents Students Association to promote events in dorms and other places on campus. By doing so, we can help expand the ongoing traditions of ACS to places outside of the Chevron Science Center.

The above are our goals for the 2009-2010 year. We are looking forward to achieving these goals with the help of all in the organization.

Graduate Highlights: Douglas Kauffman

The research interests of Douglas Kauffman, a member of the Star group, center around understanding the interactions between carbon-based nanomaterials and adsorbing molecules. Carbon nanotubes, especially single-walled carbon nanotubes (SWNTs), demonstrate extraordinary optical and electrical properties because they are composed entirely of surface atoms. SWNTs are capable of behaving as extremely sensitive transducers because their electrical and optical properties depend entirely on the extended π-electron system of the conjugated carbon atoms along the tube length, and even minute changes of their local charge environment can produce large changes to the SWNT electronic structure. This phenomenon allows the design of extremely sensitive chemical and biological sensors, as well as new supports to study catalytically active materials.



The above cartoon shows a decorated single-walled carbon nanotube (SWNT) in the presence of adsorbing gas molecules. When the SWNT functions as the conduction channel in an electrical circuit, changes in the measured current can be used to detect gas adsorption and/or catalytic reactions at the SWNT surface.

Central to this theme is the use of optical spectroscopy and solid-state electrical transport measurements of SWNT-based electronic devices. Specifically, a simultaneous combination of optical and electrical techniques can provide fundamental insight into charge transfer events that occur between the carbon nanotubes and adsorbing chemical species. This approach has been used in the Star research group to develop an understanding of the interaction between metal nanoparticle decorated carbon nanotubes and combustible gases, such as nitric oxide (NO), carbon monoxide (CO), hydrogen disulfide (H_2S) and hydrogen (H_2), as well as other environmentally relevant gases such as ammonia (NH_3) and nitrogen dioxide (NO_2).

Most recently, this line of research, in collaboration with Chad Shade and Hyounsoo Uh of the Petoud group, has produced a SWNT-based O_2 gas sensor for room temperature and ambient pressure use. Exploiting the extreme charge sensitivity of SWNTs, and the O_2 sensitivity of a Eu^{3+} containing polymer, reversible detection of O_2 gas was achieved in environmentally relevant concentrations. Ultimately, it is hoped that this technology will be developed into tiny wearable sensor devices for use in enclosed environments where size and weight are at a premium, such as in mines, submarines, or spacecraft. The details of this work were published in the September 2009 issue of Nature Chemistry. (Nature Chemistry (2009), 1(6), 500-506)

Phi Lambda Upsilon (PLU)

Phi Lambda Upsilon (PLU) is the National Honorary Chemistry Society founded in 1899. The aims and purposes of the society are the promotion of high scholarship and original investigation in all branches of pure and applied chemistry. The University of Pittsburgh Xi Chapter has been a part of the National PLU since 1917.

In the 2008-2009 year the PLU section organized several social events such as ice skating, bowling, and happy hours. PLU also sponsored the annual first-year picnic as well as the holiday party, which this past year raised over $150 in donations to the Jubilee Soup Kitchen.

One of PLU's biggest events is the annual Francis Clifford Phillips Lecture, the country's longest running graduate chemistry lecture series organized by graduate students. The 54th Phillips Lecture speaker, Dr. Héctor Abruña, hailed from Cornell University. Professor Abruña takes a multidisciplinary approach to the study of electrochemical phenomena by combining aspects of chemistry, physics and biochemistry. His research interests include the development of new materials for molecular electronics, energy-storage (i.e., lithium-ion rechargeable batteries), supercapacitors, and fuel cell applications.

In the 2009-2010 year PLU looks forward to several more social events as well as the 55th Phillips Lecture, to be held Tuesday and Wednesday April 20th and 21st. We will be pleased to welcome as our lecturer Dr. Phil Baran from the Scripps Research Institute in La Jolla, California, who represents the area of organic chemistry.

More information about PLU and upcoming events can be found on our website (www.pitt.edu/~plu) or visit us on Facebook (PluPitt).

2009-2010 Graduate Awards

Bayer Fellowship
Everett Hay

Bayer MaterialScience Fellowship
Douglas Kauffman

Goldblatt Fellowship
Kathryn Davis

K. Leroy Irvis
Tamika Madison

Mellon Fellowship
Brett Allen
Filip Petronijevic
Byong-kyu Shin

Provost's Fellow
Jie Xu
Xiangcheng Pan

Sunoco Fellowship
John Staples

Arts & Science Fellowships
Gediminas Brizgys
Adam Gagorik
Kara George
Amy Grote
Xiben Li
Richard Liberatore
Tamika Madison
Everett Merling
Brandon Mills
Elizabeth Paladen
Reza Salari
Xing Yin
Jing Zhang
Yong Zhao
Matthew Zwier

Chemistry History: On the Move I—Chemistry Space at Pitt.

As the Chemistry Department enters its 135th year, major changes are taking place in everything from the physical plant and facilities to new directions that should keep us at the forefront of academic chemistry. A series of articles for the newsletter is planned to review some history and bring you up to date. Much of the history is taken from the document that was prepared for the 125th Anniversary and soon to go on the Department's website (www.chem.pitt.edu).

In 1875 the Department was officially established as part of the Western University of Pennsylvania with Francis Clifford Phillips named as head. As he was quoted, the "complete lack of equipment is a serious obstacle." Actually, as early as 1864 the University received $20,000 to endow a chair of chemistry, geology, and mineralogy . The University was located downtown at Ross and Diamond, in the same block where the City-County building now stands. The sixteen-room building was built to serve 200 students. In 1882 the Department was moved to the Reformed Presbyterian seminary building in Allegheny, still a separate city. It was recognized from the start that these buildings were crowded, poorly ventilated, and at best temporary. Science Hall was built on Observatory Hill and occupied in 1890. Among other things it contained a qualitative laboratory, a quantitative laboratory, a chemical laboratory, a private laboratory, and a gas laboratory. It was soon recognized that this site was inadequate and when Samuel Black McCormick became chancellor in 1904, it was with the stipulation that the University "not be as it is now and where it is now." Thus began the move to Oakland along with the name change to the University of Pittsburgh.

The move was made in 1909 with Chemistry occupying space in the basement of State Hall before moving to the third Floor of Thaw Hall; both had been recently completed as part of the Hornbostel "Acropolis plan." Ground was broken in 1920 for the construction of Alumni Hall, not yet slated to become the home of Chemistry but instead to become the University's main teaching facility. It was crowded and noisy from the first but served as many as 2500 students at a time.[1] In 1925 general chemistry laboratories were moved to a two-story frame structure on Herron Hill behind the new stadium; this structure burned down in 1936 and the labs were moved to the old dental annex on O'Hara Street, approximately where the O'Hara garage is now located.

State Hall. In 1909, the Chemistry Department occupied space in the basement

After the completion of the Cathedral of Learning in 1931, Alumni Hall was vacated. In 1937 it was announced that it would be remodeled and become home to the Chemistry Department. In 1940, the general chemistry laboratories were moved, followed by the organic laboratories in 1941. After the war and particularly in the 1950s, the Department began to rapidly expand and the facilities were grossly inadequate. Soon faculty offices and labs were located in numerous buildings on campus and beyond, including Allen Hall, Langley, Space Sciences, Clapp Hall, and at the Mellon Institute. Some faculty had their offices moved to a space behind Alumni Hall into trailers. It wasn't what you would show your mother but at least they were air-conditioned!

It was clear that a new and substantial building was necessary to bring the faculty together. Professor Hurd Safford, of blessed memory, told this author that the money used to initiate the building of the Cathedral had originally been raised for a new science building. In 1974 the new building was completed and eventually named the Chevron Science Center. Chevron, Space Research Coordination Center (SRCC), and half of Alumni Hall housed most, but still not all, of the Chemistry Department. Alumni Hall was divided between Chemistry and Computer Sciences until eventually the latter moved to a new facility on Forbes Avenue. Beginning in 2002, with the financial assistance of the Eberly family, Alumni Hall was renovated to greatly enhance its function and aesthetics; it is now named Eberly Hall. New classrooms and conference areas were created and several department centers were located there, including the Surface Science Center and the Center for Molecular and Materials Simulations (CMMS). Also located there are the mass spectrometry facility, the electronics shop, the Materials Characterization Laboratory,

[1] Albert, R. C., Pitt, The Story of the University of Pittsburgh 1787-1987, University of Pittsburgh Press, 1986.

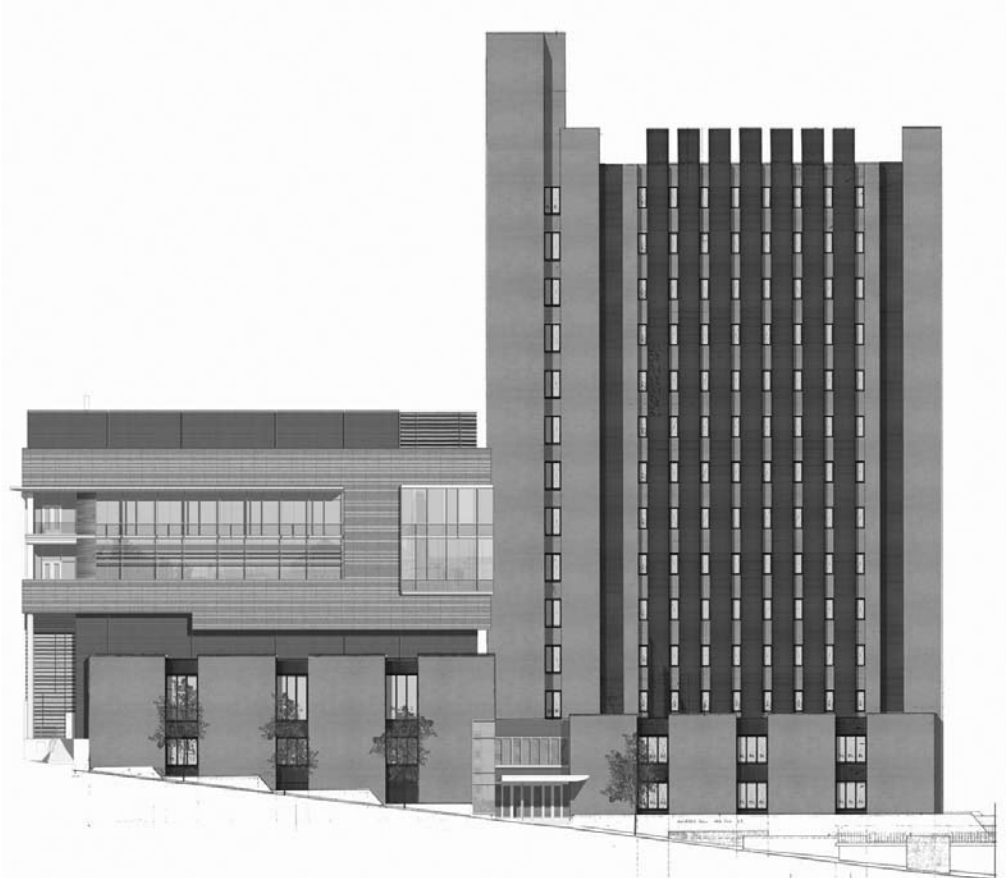
This photo shows Eberly Hall, formerly Alumni Hall, and dates from 2008.

and labs/offices for a number of faculty and students.

Major changes are again taking place. Chevron is to be renovated, floor by floor. Already the fourth floor organic teaching labs and the fourteenth floor research labs are as beautiful and modern as any such labs in the country. The first-floor classrooms (132 and 135) have been upgraded with state of the art technology and Room 130 is being converted to a modern, computer-based library. In addition the lobby is being upgraded with a new cafe, the "Bunsen Brewer," being constructed.

In addition to these improvements, the University has approved the construction of a new three story annex to be built over the Ashe auditorium complex (see artist's rendition below). This facility will provide excellent new space for synthesis, helping expand our effort in natural products and materials synthesis.

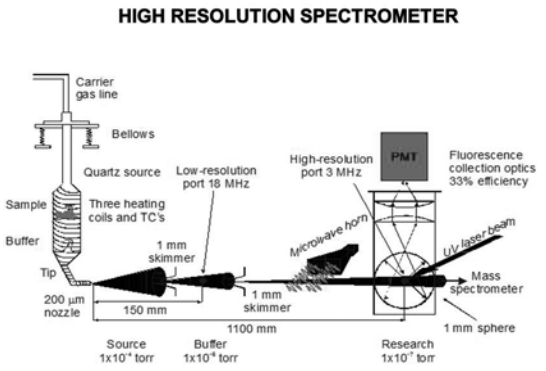
We hope that these developments will give you a good excuse to visit the department, either through the website or in person.



The image shows an artist's rendition of the Chevron Science Center with the adjoining annex constructed above Ashe Auditorium.

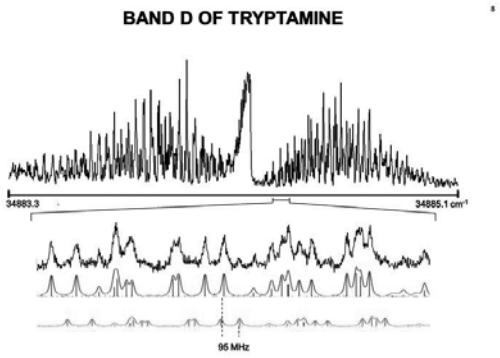
Faculty Highlights: David W. Pratt

Most people think that molecules are pretty ordinary examples of matter, just simple atoms connected by tiny springs. But chemistry professor David Pratt and his students disagree; molecules are fascinating objects that have special properties which make them important for humankind. Among these properties is their three-dimensional shape. The idea that molecules have well-defined shapes is surely the most pervasive idea in science. To quote from a famous paper by Trindle (C. Trindle, Isr. J. Chem. 19, 47 (1980), "…a detailed understanding of molecular shapes explains virtually all of chemistry".

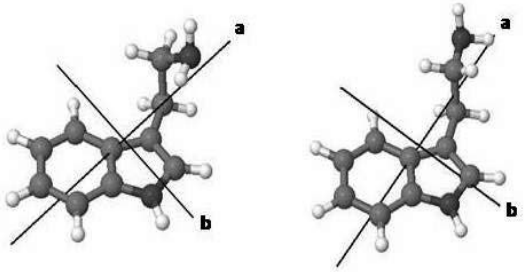


To make molecules more useful requires a deeper understanding of their structure. This understanding, as it turns out, is not easy to achieve. To be sure, a number of techniques are sensitive to molecular shape; NMR, X-ray crystallography, and IR and Raman spectroscopy, to name a few. But the samples that are studied by such techniques are usually in the condensed phase, where their shapes might be different from those exhibited by isolated molecules in the gas phase, the objects of study in most ab initio and computer modeling studies. Recognizing this, the Pratt group is engaged in developing new experimental techniques for determining the shapes of molecules in both their ground and excited electronic states. This research has been performed in collaboration with many other experimental and theoretical groups around the world.

One approach to meeting this challenge is high resolution laser spectroscopy in molecular beams (see above). In this technique, molecules are introduced into the gas phase by seeding a heated vapor into a rare gas, and expanding the mixture into a vacuum chamber, where it is "skimmed" to form a molecular beam. Further downstream, the beam is irradiated with a high resolution laser beam, producing fluorescence, and a spectrum results when the intensity of this emission is recorded as a function of the wavelength of the laser. A typical example, shown here for tryptamine, consists of thousands of lines; thus, sophisticated data acquisition tools are need for their analysis.



In the case of tryptamine, such an analysis reveals that the gas phase sample contains a mixture of seven conformers of the bare molecule, two of which are shown below. Additional studies on a particularly humid day in the lab revealed the presence of a water complex of one conformer of the bare molecule, and ONLY one (see below). Chemists will recognize this as an example of the "lock-and-key" model for enzyme activity; only one conformer of the bare molecule has the right geometry to accept a single bound water molecule.



In recent work, the Pratt group has shown how the electronic distributions of two atoms change when they are brought together to form a diatomic molecule, how a solute molecule is distorted towards a zwitterionic form when a solvent molecule is attached, how the motion of a molecule in free space is affected when it is weakly bound to a surface, how the lone pairs of a Lewis base orient themselves towards an acid in a proton-transfer (neutralization) reaction initiated by light, and how the vibrational motions of

a molecule are affected by van der Waals interaction with neighboring molecules.

Their future work will continue to focus on these questions. They plan to study the geometric constraints on intramolecular excimer formation, hydrogen atom transfer, and "water-assisted" tautomerization reactions. They are designing gas-phase mimics of function in several biological systems, such as the catalytic triad in chymotrypsin. They are measuring the extent of charge transfer on electronic excitation using applied electric fields. In addition, they are developing new techniques for the determination of the structures of large molecules in the gas phase, including a new microwave experiment being developed in collaboration with the group of Brooks Pate at the University of Virginia.

Faculty Nuggets

Billy Day was elected as a Member-at-Large to the Executive Council for the Division of Chemical Toxicology of the American Chemical Society.

Lillian Chong received an NSF CAREER Award in 2009.

Dennis Curran won the Provost's Award for Excellence in Mentoring; the American Chemical Society Award for Creative Work in Fluorine Chemistry; the Chaire d'excellence, Agence Nationale de la Recherche (ANR), France; and remains one of ISI's Highly Cited Researchers, among top researchers in chemistry (www.ISIHighlyCited.com), 2000-present.

Joe Grabowski was winner of the 2009 Tina and David Bellet Teaching Excellence Award.

Ken Jordan was elected as a Fellow of the Royal Society of Chemistry (FRSC). He was also invited to write a centennial feature article (together with cover art) in the Journal of Physical Chemistry. His *Science* magazine article (with John Yates) on cooperative reactions on metal surfaces, received wide coverage including in *Nature Nanomaterials*.

Kazunoiri Koide won the Chancellor's Distinguished Research Award in the Junior Category and the University of Pittsburgh Innovator Award.

Adrian Michael was promoted to Professor of Chemistry.

Scott Nelson was promoted to Professor of Chemistry.

Megan Spence received an NSF CAREER Award in 2009.

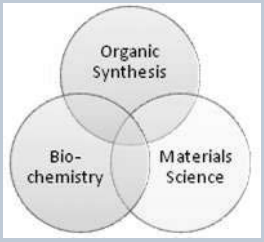
Alexander Star reported the first natural, nontoxic method for biodegrading carbon nanotubes in a Nano Letters article.

David Waldeck published a textbook entitled "Principles of Physical Chemistry" (Wiley, 2009). Also, *Science* magazine published a perspective to highlight his recent research on the importance of chirality in electron tunneling through molecules.

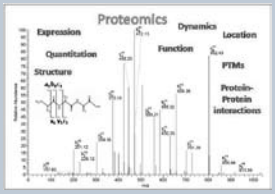
Stephen Weber won the Pittsburgh Award of the American Chemical Society and was a Plenary Lecturer at the 9th Workshop on (Bio)sensors and Bioanalytical Microtechniques in Environmental and Clinical Analysis, Montreal, Canada.

Peter Wipf was the recipient of the American Chemical Society Ernest Guenther Award.

New Faculty



W. Seth Horne. Research in the Horne lab is focused on the design, synthesis, and study of unnatural analogs of polypeptides and proteins. Proteins are ubiquitous in nature and play a crucial role in life. Chemists can modify the covalent structure of proteins and other biomolecules in ways limited only by the imagination and the synthetic ingenuity applied in the implementation of desired modifications. Synthetic protein analogues can provide new insights into the function of proteins found in nature and also act as scaffolds for the design of molecules with new and interesting properties. Projects currently being pursued in the Horne lab include the development of new chemical methods to create inhibitors of protein-protein interactions involved in disease, the elucidation of the mechanism of an amide isomerase enzyme implicated in cancer, and the application of protein self-assembly to prepare supramolecular materials that mimic aspects of photosynthesis. Seth received his PhD from Scripps and completed postdoctoral work at the University of Wisconsin.



Renã A. Sowell. The research goal of the Sowell group is to develop high-throughput proteomics technologies which can be used to elucidate the mechanisms of successful aging and immunosenescence. Proteomics is used to delineate the molecular basis of aging and peripheral immune changes which occur during aging in human and mammalian tissues. In addition, they are working on the development of novel hybrid ion mobility spectrometry (IMS)- mass spectrometry (MS) instrumentation. IMS separates molecules in the gas-phase on the basis of their collisional cross section and charge state and offers an increase in experimental peak capacity and a reduction in chemical noise when compared to traditional liquid chromatography MS/MS approaches. To carry out these research projects they take advantage of biochemistry, analytical, and bioinformatics tools. Renã received her BS from the University of Louisville, her PhD from Indiana University, and completed postdoctoral work at the University of Kentucky.

Michelle Ward Muscatello. Michelle joins our department as an Analytical Chemistry Lecturer and the Undergraduate Analytical Laboratory Coordinator. Michelle is a native of Pittsburgh, although she had completed her undergraduate degrees in chemistry and education at the University of North Dakota. Prior to returning to school to pursue her graduate studies, Michelle taught chemistry in a local high school for four years. Michelle received her PhD from the University of Pittsburgh under the direction of Professor Sanford Asher. Michelle looks forward to revamping the curriculum and instrumentation for the Introduction to Analytical Chemistry and Instrumental Analysis laboratory courses. In addition to traditional routes, she is actively pursuing collaborations with industrial leaders, such as PPG Industries and Bayer MaterialScience, to ensure our students' experiences leave them competitively poised for success in either industrial or academic pursuits.

In Memoriam

Peter Siska, died at age 65 on February 27, 2009 in Oakmont, PA. Born in Evergreen Park, Illinois, he received his bachelor's degree in chemistry with minors in physics and math from DePaul University in Chicago, and his PhD in physical chemistry under the supervision of Prof. Dudley Herschbach at Harvard University as a National Science Foundation Fellow. Following a postdoctoral appointment at the University of Chicago with Prof. Y.T. Lee, he launched his academic career at the University of Pittsburgh in 1971, where he conducted pioneering research in molecular beams. While at Pitt, he was an Alfred P. Sloan Fellow, and he chaired a Gordon Research Conference on atomic and molecular interactions in 1984. He dedicated countless hours to training graduate and undergraduate research students. Among his scientific publications is a highly cited review on Penning ionization.

His passion and gift for teaching honors freshman and physical chemistry were recognized by a Chancellor's Distinguished Teaching Award in 1987, an Innovations in Education Award in 2001, and a Bellet Undergraduate Teaching Excellence Award in 2003. He taught in the University Honors College since its inception at Pitt in 1987. Peter was a visiting professor at Harvard in 1998, where he taught honors freshman chemistry. He is the author of *University Chemistry*, an honors freshman chemistry textbook, which was published in 2006. He was a volunteer for the Chemistry Olympics at Pitt for many years, and gave the Faraday Lecture and National Chemistry Week demonstrations.

Outside of chemistry, his interests included history, astronomy, travel throughout the U.S. and Europe, classical music, and above all, his wife and children. Peter is survived by his wife of 41 years, Jeanne (Artman) Siska of Oakmont, his son, Dr. David Siska of San Francisco, his daughter, Dr. Sarah Siska (Dick) of Evanston, IL, his mother Marie Siska of West Lake Village, CA, two brothers Dr. William Siska of Salt Lake City, UT, and Robert Siska of Thornton, CO, his sister, Margaret Siska of Agoura Hills, CA, and many nieces and nephews.

Johannes Coetzee, 84, emeritus professor of chemistry at the University of Pittsburgh, died on December 3, 2008. Born and raised in South Africa, he received a BSc degree as a physics and chemistry major at the University of the Orange Free State (now the University of the Free State) in Bloemfontein, South Africa. Upon graduation he served as a demonstrator in their chemistry department. He then secured a teaching assistantship studying polarography with I.M. Kolthoff at the University of Minnesota, and he earned a PhD in analytical chemistry in 1956. Johannes returned briefly to South Africa to teach at the University of the Witwatersrand. In 1957, he joined the University of Pittsburgh as an assistant professor. He became professor in 1966 and emeritus professor in 1989. Johannes' research focused on electroanalytical chemistry and the properties of solutions, particularly solutions of electrolytes in dipolar aprotic solvents. Early in his career at the University of Pittsburgh, he did research on the effect of solvents on metal-ligand exchange reactions. In the early 1980s, he became interested in the use of potentiometric sensors as a tool for determining solvent purity. Johannes published nearly 100 papers and edited several books. He was active in the Pittsburgh section of the ACS, in the Society for Analytical Chemists of Pittsburgh (SACP), and the Pittsburgh Conference on Analytical Chemistry & Applied Spectroscopy. He was a member of the Steering Committee of the International Conferences on Solution Chemistry and was involved in the Commission on Electroanalytical Chemistry and the Analytical Division Steering Committee of IUPAC. He received the Distinguished Achievement Award from the University of Minnesota, the Pittsburgh Award from ACS, and the Analytical Chemistry Award of the SACP. He is survived by a son, Frans; and one grandchild.

Peter Siska

Johannes Coetzee

Memorial Funds (Donations may be made directly through the Department. Please indicate the fund by name.)

1. The Johannes Coetzee Memorial Fund is being created to endow a lecturership in Johannes' memory.

2. The Peter Siska Memorial Fund is being created to endow an undergraduate student research stipend.

University of Pittsburgh

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Alumni Updates

Mark Ams (PhD 2007; Advisor: Wilcox): began a new position as Assistant Professor of Chemistry at Allegheny College this fall.

Andy Held (PhD 1993; Advisor: Waldeck): Director of Business Strategy and Development, Multiwave Photonics.

Patricia B. Jacobs (PhD 1987; Advisor: Curran): retired from Bayer Material Science.

Steven A. Koch (BS 1979): left the field of chemistry, after 24 years, and started a career in banking as a Personal Banker Business Specialist at JP Morgan Chase.

Harmon Tunison (MS 1986): Lockheed Martin, Senior Chemist.

Ralph E. Yingst (PhD 1964; Advisor: Douglas): Retired from Youngstown State University (Emeritus Professor).

For others (1969) see page 2.

Information Please

We are very interested in hearing about the accomplishments of our alumni and former colleagues in the Department of Chemistry. If you have news to share please complete the top portion of the enclosed envelope or contact Michele Monaco by telephone (412-624-8200) or e-mail (monaco@pitt.edu) so that we can share your information with the rest of our readers. The information that you provide to us will be included in future mailings or on the Departmental website.

We are looking forward to hearing from you!