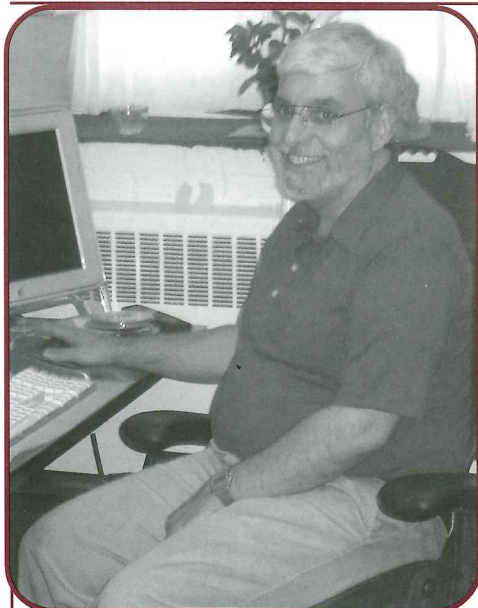


ELEMENTS

The Alumni Magazine of the Department of Chemistry at Virginia Tech



From the New Department Chair

Greetings from the new Chemistry Chair. Well, I don't feel all that new, reupholstered at best, but I am delighted to be the Chair of the Chemistry department. Let me give you a 25+ year

career so that you may know a little better who I am. After receiving my Ph.D. in Inorganic Chemistry in 1978, I joined the Corporate Research Laboratories of Exxon in Linden, New Jersey. For nearly 10 years, I was involved in catalysis research, much of it dealing with transformation of CO and H₂. At the time, this research was spurred by the "oil embargo" and the need to develop alternate sources of fuels to end our dependence on Middle Eastern oil. After the embargo was lifted, oil prices dropped and so was this research.

In 1987, I decided that, as much as I enjoyed doing industrial research, I really would like to move to an academic career. My hope was that I could still do interesting research and at the same time be involved in teaching. My wishes were more than fulfilled and I can honestly say that my 17 years at Virginia Tech have been a real joy. I started in 1987 as an Assistant Professor and, as they say, quickly rose through the ranks being appointed Full Professor in 1995. In 1998, I was asked by Bob Bates to be Associate Dean of the College of Arts and Sciences with responsibilities for research and outreach. This was a particularly delightful time for me as I very

much enjoyed working with the breadth and diversity of disciplines in the College.

In the fall of 2000, I was appointed acting Dean of the Graduate School in order to oversee the separation of the Graduate School from the Office of Research and Graduate Studies. I suppose I did such a good job at that reorganization that in May, 2001, I was asked to reorganize the entire academic structure of the university. I oversaw the process of reorganizing the colleges into the ones we have now.

At that point I was homesick and I returned to the department in order to teach and take up my research once again. In what must have been a weak moment, I agreed to run for Department Chair, so here I am.

I am delighted to be the chair of such a great department. We have our challenges to be sure, but THIS IS A GREAT DEPARTMENT. I am honored to be able to play a role in helping our department move to ever higher levels and in a future communication I look forward to telling you more about our plans and accomplishments. For now, I hope this has helped you to know me a little better and I invite you to drop me a line or stop by when you are visiting Blacksburg. All Chemistry Hokies still have a home in the department.

Continued on Page 8

What's Inside:

<i>Faculty In The News</i>	3
<i>Faculty Spotlight</i>	5
<i>Alumni Highlights</i>	9
<i>Staff Spotlight</i>	11
<i>Student News</i>	12
<i>What's New in Chemistry</i>	13
<i>Student Highlight</i>	14
<i>Donors</i>	15



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Advisory Council Chairman Retiring

Retired? I don't think so!

E. Gary Cook
(Ph.D., 1970)

I was born in Birmingham, AL, just ahead of the onslaught of the baby-boomers. The experts used to include those of us who were born in 1944, but sometime during the 1980's, they arbitrarily excluded 1944 and 1945. I think it was because we were a little too early to participate in the sexual revolution and weren't very good at controlled substances, but I digress. I was the youngest of five children, and the only son born to a Mother of 39 and a Father of 45, and 6 years after my nearest sister. This realization has always given me a great respect for planning in general. I attended the same schools that all of my sisters had and in fact, the same high school that my Mother had attended. Unfortunately for me, all of my sisters were well behaved, well mannered and always respectful of their elders, leading to some unfortunate comparisons.

I grew up in a fully segregated society, and like most of my friends, never ventured more than a couple of hundred miles from our homes until we were near adults. Our family owned no car, so I grew up thinking public transportation was the way people actually got around. Reading, sports and music were my continuing childhood passions, with my sisters teaching me how to read very young. I came from a musical family. My Father had been a professional singer in the 20's and my Mother and he met while she was playing piano for a quartet of which my Father and my Grandfather were the Bass and the Tenor, respectively. Everyone in the family was expected to be able to sing in harmony and all the relatives' homes were always filled with singing.

At seventeen, I went off to the University of Virginia where I majored in Chemistry. I am still not sure exactly why I chose Chemistry as a major at that time, but I never have regretted it for a minute. Between my junior and senior years, I won an NSF fellowship to go and do research at Virginia Tech. There, I met my future research advisor, John Schug. Graduate school was like anyone else's experience. No money, late nights in the computer center and griping about how many courses we had to take. I had decided that the industrial, instead of the academic, life was for me so I was anxious to get out and get to work. I completed my thesis in three years (the advantage of being a theoretician is that there are no nasty experiments to get in the way) and went to work for DuPont in the fall of 1969. With DuPont for 21 years, I moved all over the country, divorced, met my wife Brenda, combined our families and held too many



positions to enumerate. Brenda was a career woman, holding a number of management positions in Avon and then serving as national director of operations for a 150 store-chain of fitness salons. In the 90's, I decided to leave DuPont and became President of Albemarle and Chairman and CEO of Witco, before retiring at the end of 1999.

Astonishingly enough, over these years, our four children became adults, a prospect quite doubtful during their teens. They now range in age from 31 to 38. The oldest is a Commander in the U.S. Navy, who just finished a tour as Executive Officer of TopGun (he flew F14D TomCats in the fleet and looks like Tom Cruise in the movie except that he is 6'3", 240) and is now in the War College in Newport, RI. The other three all live in Jacksonville, FL, where Brenda and I moved when I retired. Our youngest daughter just had our fourth grandchild and third grandson, and our younger son's wife is pregnant with our fifth (gender as yet unknown). The older daughter just passed the Florida bar after moving here from California. The reason for talking about all this is that our major activity for the past two years has been building a new house. Brenda found a beautiful piece of property on the St. Johns River. We tore down the existing older home and began construction.

Living on the river, we bought a boat and jet-ski and have become true water people. I have continued a lifetime involvement with United Way, serving on the Board of Trustees and heading up Planned Giving for UW of NE Florida. Brenda is of the firm opinion that traveling, building a house, spending time with our children, grandchildren, and our extended families, as well as my involvement with Virginia Tech, should be quite sufficient to constitute post retirement. I apparently am congenitally unfit for continuing leisure.

Shortly after retiring, I joined the board of Trimeris Corporation, a biopharmaceutical company in Durham, NC. A few months later, I became a director of Louisiana-Pacific Corporation, a building products company then

Continued on Page 6



Faculty In The News

Daniel Crawford recently gave an invited lecture at a meeting in Sonderborg, Denmark, entitled "Response Theory and Molecular Properties". About 150 participants attended the meeting, which was held in part to honor Professors Jan Linderberg and Poul Jorgensen, two Danish pioneers in the field of electronic structure theory. Daniel was one of five Americans who spoke at the meeting, and his talk focused on his group's recent work on local correlation methods in response theory, including electric polarizabilities, excited states, and optical rotation.



Daniel Crawford's laboratory hosted the third PSI/MPQC Summit, with visitors from Sandia National Labs (Livermore, CA), Georgia Tech, and Bethel College (St. Paul, MN). PSI and MPQC are program packages for molecular ab initio quantum chemical calculations. The purpose of the workshop was to continue the group's efforts to integrate/extend

both programs to mutual benefit. While Daniel's research group's programs (PSI) focus on new theoretical methods and properties, the Sandia programs (MPQC — Massively Parallel Quantum Chemistry) focus more on large-scale implementation on supercomputers (like VT's new System X). The previous two PSI/MPQC Summits were held in March 2001 here at VT and March 2003 in Livermore.

Daniel also gave an invited lecture at Cambridge University, entitled "Molecular Quantum Mechanics", held in honor of Prof. Nicholas C. Handy, another pioneer in electronic structure methods who will retire this year. This meeting is a "who's who" in quantum chemistry, and probably every major, active researcher in the field attends. This series of meetings (held every three years) has typically had around 400-500 participants. Daniel was one of 25 invited speakers, and his talk discussed his group's recent studies in chirality and natural optical activity. In addition, Daniel's graduate students, Mary Tam, Chris Smith, and Nick Russ also attended the meeting and presented posters on their recent work.

Daniel Crawford was given a Young Investigator Award from John Wiley & Sons Publishing Company and the University of Florida's Quantum Theory Project at this year's Sanibel Symposium in St. Augustine, Florida.



Professor Larry Taylor hosted the annual three-day Southeast Chairs of Chemistry Meeting in Blacksburg last spring. Derrick Tabor from the National Institutes of Health and Art Ellis from the National Science Foundation were guest speakers.



Karen Brewer's proposal, "Visible Light Induced Inter-actions with DNA by Rhodium Centered Supramolecular Assemblies," has

been recommended for funding by the Division of Chemistry at NSF. Brenda Winkel, Department of Biology, is a co-investigator on the grant.



Kay Castagnoli was featured on the Hayden-McNeil website as their spotlight author of the week.

Faculty In The News Continued from Page 3



Tim Long has been listed as a winner in the FY 2004 competition under the Defense University Research Instrumentation Program (DURIP). The Department of Defense announced plans to award \$43.5 million to academic institutions to support the purchase of research instrumentation. Along with Tim's proposal, three other Virginia Tech faculty proposals were recognized.

Tim Long has received an invitation with financial support to spend one week in Japan in November 2004 in order to lecture at numerous prestigious Japanese universities.

The International Union of Pure and Applied Chemistry (IUPAC) sponsored a meeting dealing with macromolecules in Paris, France last summer. The international conference consisted of nearly 1500 poster presentations and 600 lectures. Prof. Tim Long was invited to present a lecture dealing with recent advances in real-time reaction monitoring using mid-infrared spectroscopy. The conference was attended by nearly 3000 participants, including several plenary lectures by Nobel Laureates including Jean Marie Lehn in the area of supermolecular structure. Prof. Long's presentation described efforts in stable free radical polymerization, polyurethane synthesis, and the formation of stable phosphorous containing nitroxides.

Patricia Amateis and Jeannine Eddleton were recognized in the 2004 10th Annual Student's choice competition. Sponsored by the Student Alumni Associates of the Virginia Tech Alumni Association.



Gary Long recently appeared on "Blue Ridge Live" (PBR) to discuss the Mobile Chemistry Lab program which this year is not operating due to a lack of state funding.



Winners of the Gary Cook Faculty Teaching and Research Awards at the 2004 Graduation Ceremony were Jim Tanko and David Kingston, respectively. Dr. Tanko also won the Clifford Faculty Service Award presented at the Undergraduate Award Ceremony this past spring. A special service award was provided to John Dillard for his exemplary service to the Department in the planning, construction, equipping, lab re-location, and now perfection of the Chemistry-Physics Building.



James McGrath and Virginia Tech Provost Mark McNamee of Blacksburg have been awarded a two-year, \$600,000 National Science Foundation

Partnership for Innovation (PFI) grant to support the program. The award is McGrath's second PFI. The Materials Research Institute, which McGrath has headed for 17 years, also received a two-year \$600,000 grant in 2001 to develop efficient inexpensive fuel cell materials. Other Virginia Tech researchers who will be active in the PFI are Michael von Spakovsky, Professor of Mechanical Engineering and Director of the Center for Energy Systems Research, and Judy Riffle Professor of Chemistry and Director of the Macromolecular Science and Engineering graduate degree program.

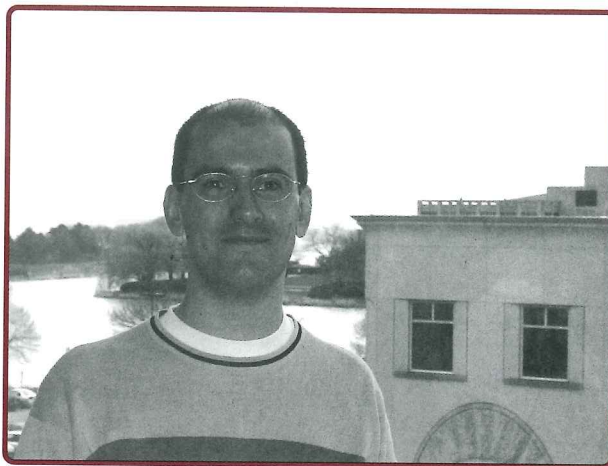
Faculty Spotlight

Diego Troya is a new assistant professor in the Department of Chemistry. He comes to us from Northwestern University, where he was a postdoctoral fellow for two years.

Diego was born in La Rioja, the renowned Spanish wine producing region, in 1975. He grew up in Logrono, the capital of La Rioja, where the region's university is located.

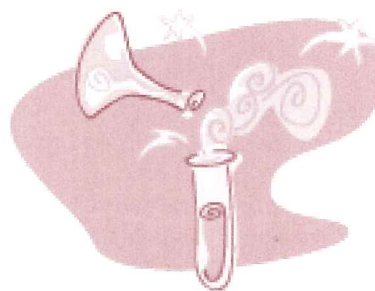
Opting to become a scientist rather than cultivate the family vineyards, he graduated with honors from the University of La Rioja in 1997. He also completed his graduate studies there. Diego's Ph.D. research was developed all over the world. He worked in the Department of Chemistry at the University of Barcelona in 1998 and 1999. Then he traveled to the United States in 1999 and 2000 to work at Northwestern University in Evanston, IL. In the spring of 2001 he collaborated with Dr. George Lendvay at the Institute for Chemistry at the Hungarian Academy of Sciences in Budapest, Hungary. He finally defended his dissertation in October 2001, back at the University of La Rioja. After graduating, Diego moved permanently to the United States. From 2001 to 2004 he did postdoctoral research in the Theory Group of the Department of Chemistry at Northwestern University under the supervision of Professor George C. Schatz.

Diego's research interests are quite broad and focus primarily on the chemical and physical properties of novel materials such as hydrocarbon self-assembled monolayers and carbon nanotubes. One of his active fields of research is the investigation of the degradation of polymers used to coat spacecraft and satellites that operate in harsh space environments. Diego uses molecular simulations to help understand a variety of phenomena which jeopardize the normal operation of satellites and spacecraft such as the Hubble telescope and the International Space Station. Using computers, he also contributes to the modeling of the interactions of exotic atmospheres, such as that of Venus or Mars, with



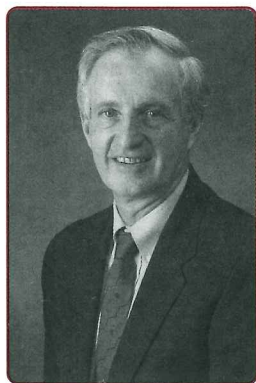
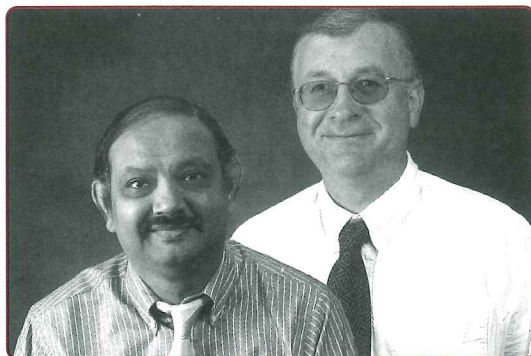
man-made materials. Diego also studies the mechanical properties of the strongest materials known: carbon nanotubes. Using large-scale computations, Diego models the fracture of these extremely strong but lightweight materials under extreme conditions of pressure. Diego collaborates with investigators not only at Virginia Tech, but at different universities and research centers throughout the United States and Europe.

When Diego is not in the office, he enjoys cooking traditional Spanish recipes, such as Tortilla (potatoes omelet) and Patatas a la Riojana or any other interesting recipe he finds out. He is also an avid Chicago Cubs baseball fan, listening to as many games as he can via internet. American football is still something of a mystery to Diego, however; perhaps the great Hokie football team will inspire him to learn more! He also likes to bike, play squash and soccer, and enjoy the beautiful Virginia mountain scenery. He likes to spend any free time he has with his girlfriend, Kelly, who plays with the Syracuse Symphony but manages to find time as often as possible to visit Blacksburg. They enjoy having friends over to their house. Kelly also loves to cook and bake, and can occasionally be counted on for providing homemade cookies for Diego's Statistical Mechanics class. As a new resident to Blacksburg and Virginia, Diego is always happy to hear about interesting sites and attractions in the area, and meet all of the new faces. The door to Davidson 406 is always open; please stop by!



Faculty In The News Continued from Page 3

The awards committee of the Center for Innovation in Learning has selected Professors Marand and Trivedi as project co-leaders, to receive the 2004 XCaliber Award for excellence for a team involved in teaching with technology. This award is part of the university's efforts to recognize outstanding contributions of faculty and staff who are integrating technology in teaching and learning activities. Trivedi, Instructor of Chemistry, and Marand, Professor of Chemistry, developed a Chemistry DVD, which provides a fully guided, self-paced learning environment. It provides students with three-dimensional animations and videos of chemical experiments, allowing them to experience a hands-on learning environment through technology. The DVD also affords a student at a distance the opportunity to view chemical experiments as if they were in a classroom. Students take tests at frequent intervals throughout the lessons to determine their understanding of the material. The DVD has been used on campus and at Virginia Tech sites in Richmond, Abingdon, Northern Virginia and Tidewater.



Harry Gibson has received the 2004 Alumni Award for Research Excellence. Gibson's research focuses on supra-molecular chemistry, "chemistry beyond the molecule," continuously supported by the National Science Foundation since 1987. Gibson and his group pioneered the application of molecular recognition and self-assembly to the synthesis and characterization of novel polymer architectures, the polyrotaxane family, via "threading" cyclic moleculars with linear polymeric molecules, forming molecular analogs of strings of pearls with potential applications ranging from electroactive materials and memory devices to drug delivery.



Advisory Council Chairman Retiring Continued from Page 2

conveniently located in Portland, OR. An old mentor of mine from DuPont approached me to become involved with a start-up company with unique technology for converting waste into hydrogen or power. I was so impressed by the technology, that I ended up becoming the Executive Chairman of Integrated Environmental Technologies, LLC (IET). I became Chairman of the Board of Louisiana-Pacific this year. It's not a full time job, but I do have my hands full most days and I can fully testify to the charms of air travel in the 21st century. I turn 60 this year but my interests still include my childhood passions of sports, music and reading. I still am an avid reader, going through two newspapers daily, 7-10 magazines and industry publications weekly, and 8-10 novels monthly. I still sing, but only for my own entertainment, with the exception of an occasional karaoke performance after too many adult beverages. Grandchildren are God's greatest inventions, and they have clearly overtaken sports, music and reading as my major hobby.

For those readers who are getting close to retirement age, everything good you have heard about it is true. If I had known how great it is to be retired, I would have tried to figure out how to have been born independently wealthy and do it much younger. Of course, the kindest, but most accurate observer of Gary Cook, the love of my life, Brenda can be heard to say, with love, but with the slightest hint of exasperation, "Retired? I don't think so!"

Retired Faculty Spotlight

David Larsen taught at Virginia Tech from June 1967 to June 1996 and retired in 1998. He taught a series of courses, "Electronics for Scientists": the basics of electronics as it relates to measurements and automated data collection techniques. David taught numerous short courses over the years in instrumentation and automation, not only at Tech, but at other places in the U.S., in Italy in the late '70s and in the Soviet Union in the early '90s. In 1978, David received the Faculty Service Award from the National University Extension Association, one of five such awards given nationwide that year.

From 1974 to 1984, David was involved in the creation of a book series used in electronics and computer education. The series started as the "Bug Books", and evolved into more than seventy books in the "Blacksburg Continuing Education Series" published by Howard W. Sams. Eventually, millions of copies were distributed and much of the series was translated into various languages.

During his last ten years at VT, David worked with the Office of International Development for the University. A number of faculty and student exchanges were arranged, and memorandums of understanding (MOUs) were fashioned with universities in the former Soviet Union. David received the Faculty Service Award in 1995 for "outstanding service in the outreach mission".

After retirement, David and his wife Gaynell founded a non-profit foundation, Foundation for Amateur International Radio Service (FAIRS). The foundation works with groups in less fortunate countries to develop emergency radio communications systems and provide medical and equipment assistance. FAIRS often facilitates international "people to people" exchanges. David and Gaynell direct the activities of the foundation and, if you speak with them, you will sense the passion they have for this work of helping people.

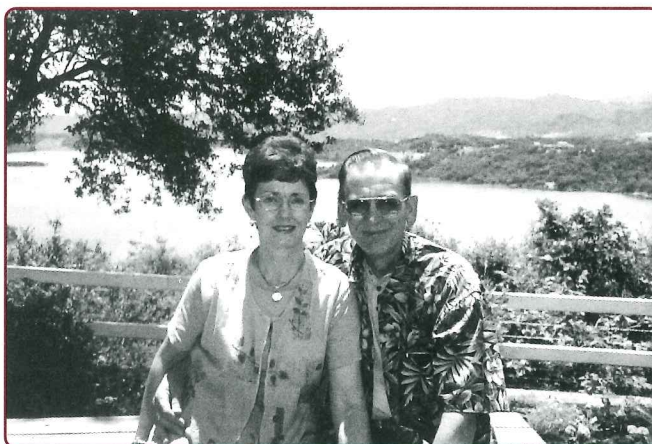
The FAIRS foundation is partially subsidized by real estate work in which David and his wife have personal interest. David owns and develops many recreational and farm properties in Montgomery, Floyd and Franklin Counties. He works toward a parcel that is ready to build upon, then markets to the buyer along with a financing package. Since he is "retired" and works with his own property, he can do this as he enjoys and on an "as funds are needed" basis.

David and Gaynell have 5 children and 16 grandchildren! Family has become an increasingly important part of their lives as they grow older. They make a point to develop a closer bond with each one as an individual.

For that reason, when a grandchild is between the ages of 11 and 14, he or she is invited to travel internationally with "Pa Pa and Gay Gay", to share a great experience and consider dreams and goals. Some memorable destinations have included Trinidad, Dominica, Martinique and Puerto Rico.

David would like for alumni and others to call and "catch up".

Reminisce about the old times or talk about the future. David may be reached at 540-763-2321 evenings after 7:00pm.



Department Chair Continued from Page 1

Former Department of Chemistry Chair, Larry Taylor, symbolically passes the keys to chemistry to current chair, Joe Merola, during an appreciation party held at the John and Martha Dillard farm on June 30, 2004. A good time was had by all.



Chemistry Picnic





Alumni Highlights

I have followed with interest the growth of Tech's Chemistry Department as reported in the Departmental newsletter that I receive. I often wish I could "redo" my Chemistry degree with today's tools and technology - when I was there, the computer "geeks" were doing their programming with punch cards in the wee hours of the morning! We used to think they were so weird! Now, they "rule" the world! Oh, to do it over again ... Martha Ryhanych (B.S. '78)

Robert M. Johnson (B.S. '96) received a Ph. D. in chemistry from University of Virginia and works as a research chemist in the physical and analytical sciences division of the Lubrizol Corp. in Wickliffe, OH



The Instrumentation, Systems, and Automation (ISA) Society has honored Jerry M. Clemons (Ph.D. '77) with the Kermit M. Fischer Environmental Award. For over 20 years, Jerry led and directed the research and development function for ABB Process Analytics as vice president. Today he serves as a consultant to ABB Process Analytics. As a senior scientist, Jerry led the development of novel techniques for the measurement of low-level environmental contaminants. He is also known for development of applications to monitor cooling towers and flares for Highly Reactive Volatile Organic compounds used in the Houston/Galveston, Texas area to reduce oxides of Nitrogen. ISA is a 33,000-member global, nonprofit, educational organization which fosters advancement in the theory, design, manufacture, and use of sensors, instruments, computers, and systems for automation + control in a wide variety of applications.

Steven Choquette (Ph.D. '88) has been elected to serve a three-year term on the Analytical Chemistry Editorial Advisory Board. Steve is a research chemist at the National Institute of Standards and Technology. His current research involves the development of performance validation standards for near-IR and Raman instrumentation, analytical applications of vibrational spectroscopy, and the development of instrument independent spectral libraries.



Bill Bryant (Ph.D. '99) recently finished his MBA from Rutgers in Newark, NJ. Up until July of this year he was employed with Specialty Minerals, Inc. in Easton, PA as a Research Scientist working in the plastics lab on special projects. Since then he took a new job with IMERYS Pigments in Atlanta, GA as a Senior Business Development Analyst for the North American Performance Minerals marketing group. Wife, Kerry, and he have three beautiful girls, Caitlyn (6), Courtney (4), and Callie (2). They now live in Alpharetta, GA. Bill was recently given the outstanding young Alumni Award by the College of Science.

Marilyn Gatin (Ph.D. '92) had a booth at the 1st annual Women and the Arts Event in downtown Indianapolis. The art fair was billed as "an all-inclusive event for artists and art-lovers, discovered and undiscovered, celebrating the timeless contributions of women to the arts and culture." Marilyn offered her Circuit Board sculpture and photos, jewelry made from Circuit Board components, and she debuted her floral photography at the event. See some of Marilyn's work at

www.CircuitBoardArt.com.

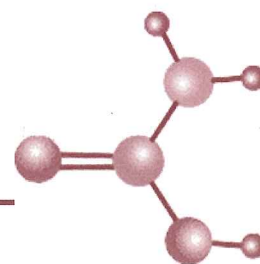


Mitchell Koppelman (Ph.D. '77) gave the Department of Chemistry Commencement address May 2004. Mitchell worked for the Georgia Kaolin Company in New Jersey from 1976-1983 doing research, product development, and technical service in the area of paper filling minerals and then became marketing manager for Paper Industry Products for GK from 1983-1989. Mitch met and married Debbie Burns, who also worked for GK, in 1984. They have raised two children. He left voluntarily in 1990 to join Pfizer's Mineral Division. He headed Pfizer's marketing efforts for calcium carbonate products in paper, grew its global scope to about \$250 million, and then became head of the North American part of the business shortly after Pfizer divested the Division. Minerals Technologies, Inc. was formed in 1992. He ran MTT's North American Precipitated Calcium Carbonate business from 1994-1998. In 1998, he was offered the job of Global R&D Head for Minerals Technologies' largest subsidiary company, Specialty Minerals. In 2001 he was elected a Corporate Officer and currently heads a Corporate Development group focusing on strategic planning and mergers and acquisitions.

Bill Coleman (M.S., '71, Ph.D. '77) gave the after dinner presentation at the Spring Advisory Council-Faculty banquet in April.

James E. Smith (B.S. '66) has been named President-elect of the Virginia Tech Alumni Association. Smith is self-employed and retired from E. I. DuPont in Wilmington, DE

Alumni Highlights Continued from Page 9



Paul Chirik (B.S. '95) has found a way to split molecular nitrogen using a zirconium compound. He and his research team at Cornell published their work in the February 5 issue of the science journal

Nature. Chirik's work is still experimental, but he says there are plenty of potential applications for the process. Products as diverse as fabric dye and fertilizers all contain nitrogen, which he describes as "the business end of all sorts of drugs." Chirik received his doctorate at Cal Tech and did post-doctoral work at MIT, but he says the faculty members at Virginia Tech were some of his best mentors. "If I had to credit one person who put me on the path to what I do now, it's Joe Merola."

Jennifer R. Sadula (B.S. '96) works at the U.S. Patent Office in polymeric liquid crystalline compositions.

Gretchen Woods (B.S. '95) is a freelance writer in Richmond, Kentucky.

Adam M. Hawkrige (B.S.) co-authored a paper in *Analytical Chemistry*, 2004, 76, 4118-4122 entitled "Analytical Performance of a Venturi Device Integrated into an Electrospray Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometer for Analysis of Nucleic Acids".

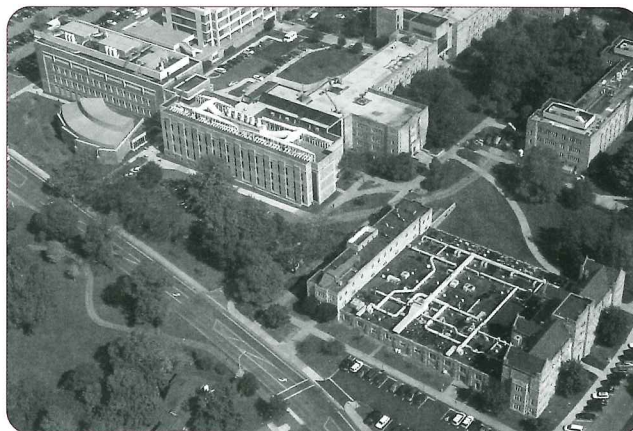
Other News



New administrative assignments in the Department of Chemistry include Professor Brian Hanson, Associate Department Chair, Professor Mark Anderson, Director of Graduate Studies, and Professor Brian Tissue, Director of Undergraduate Studies.



Roberta Gilbert has accepted the position of Business Manager for the Chemistry Department. She will be responsible for managing all aspects of the Department budget. The creation of this new position is one step in the reorganization of the Department's business functions.



(photo by Wanda Hensley & John Dillard)

Chemistry Buildings - Davidson, Hahn and ChemP.

Staff Spotlight



Wanda came to the Chemistry Department in 1985 where she worked part-time as Dr. Harold McNair's secretary. Her office was on the 4th floor of Davidson and it's told that she used a rickety old typewriter and didn't even have a decent chair. But even then Wanda showed her dedication by driving her mom's old 'clunky' car all the way from Pulaski for just a few hours a week. Her dedication, though, was noted and she was given additional hours in the main office. Wanda was determined to prove herself and get a full-time position. She worked and worked and worked to pass her typing test and was eventually hired in a full-time position in the main office. She has been described as quiet and shy and a harder worker. And now, approximately 19 years later, while she

is still a hard worker, quiet and shy are words no longer used to describe her. All joking aside, those who know Wanda will tell you that she is pleasant, courteous, friendly, cheerful and very outgoing. She has gone from struggling to pass a typing test to teaching others computer skills. Wanda has also become the aerial photographer of the Dillard & Wanda Flying Team. Combined with Dr. Dillard's awesome flying expertise and Wanda's unbelievable ability to keep steady and compose beautiful photos, the construction of the ChemPhysics Building has been well-documented.



Another word that describes Wanda perfectly is friend. She has a caring, loving, sensitive heart. Whether it's an illness, operation or family crisis, she is always there to lend a helping hand or a shoulder to cry on. And if you've been lucky enough to have traveled with her, you know she is lots of fun. Our trips to Mobjack (thanks Juanita and Jim Wightman) and Ocean Isle (thanks Gail and Larry Taylor) are always very memorable. And just in case you didn't know, there are many different routes to both of these places (some just take longer than others).

Wanda was the recipient of the 2004 Harold McNair Service Award – a very deserved recognition.

Outside the office, Wanda is very active with her church. She serves as chairman of the board, sings in the choir and helps with every event possible. Wanda also loves to go 4-wheeling (especially weekends at the tree farm) – we're still trying to secure a picture of her covered in mud. She loves animals and is the proud 'mama' of two labs, Nelli and Lexi, and Buster (beagle mix maybe). And just recently Wanda has become the owner of a horse – a life-long dream of hers. She works with "Smokie" every day and shares wonderful stories with her friends in the Chemistry Office. She even attended a conference where she could learn more about caring for 'Smokie'. Her husband, Allen, daughter, Brittney, and daughter and son-in-law, Ashley and Jayson are very supportive and do many activities together as a family.



Student News

Matthew D. Shoulders (B.S. '04) has been selected to receive the OKO Medallion Award. The Virginia Tech Chapter of the Honor Society of Phi Kappa Phi honors the graduating senior with the highest QCA in each of the seven colleges within the university. Matt was selected by the College of Science to receive this award.



Alexis Wells is from Reva, Virginia and a second generation Hokie. In addition to majoring in Chemistry (4.0 overall GPA), Alexis is also a member of the Chemistry Club, Residential Leadership Community, and Intervarsity Christian Fellowship.

During high school she was captain of her cheerleading squad and feels that the opportunity to be a team leader has taught her the value of working with others and the importance of strong leadership. Upon graduation Alexis plans to pursue a career in forensic science at the Masters or Doctorate level and plans to work for the government crime laboratory. One of Alexis' professors says of her, "Alexis was one of 12 A's in a class of about 100 ... In addition to learning the material, she often helps other students understand it... In addition to her academic skills, she is a genuinely nice person."

Ji Lim is a rising sophomore Chemistry major from Yorktown, Virginia. Ji has a 4.0 overall GPA and hopes to become a research chemist. To her, learning chemistry is like learning a new language, and part of her goal is to understand all there is to know about drug chemistry and to discover the miracle drug which will cure cancer. Chemistry has always been the focus of Ji's study and center of her interests. Studying chemistry and learning the foundation of all matter has given her the desire to discover more about what is really going on in the micro-world inside a laboratory test-tube. She is especially interested in the chemistry of different types of medicinal drugs and how the chemicals in those drugs interact with chemicals in our body. When talking with professors about Ji, you will hear such remarks as "She is smart, hard working, contributing and sensitive and respectful both towards her peers and the classroom instructors."

DEPARTMENT HOSTS SUMMER 2004 MULTICULTURAL ACADEMIC OPPORTUNITY PROGRAM STUDENTS

*Patrice May from University of Arkansas at Pine Bluff, Professor J. Merola, Mentor

*Marilyn McCorn from Tufts University, Professor Paul Deck, Mentor

*Vidhya Sivakumaran from St. Paul's College (VA), Professor Alan Etzkorn, Mentor

*Shatara Mayfield from North Carolina A&T, Professor Karen Brewer, Mentor

An enzyme called Pin1, a gatekeeper of cell division, is present at high levels in a wide variety of cancer cells. Virginia Tech researchers who are designing small molecules to inhibit Pin1 are seeing promising results with a small U-shaped molecule. Felicia Etzkorn reported on her group's achievements in presentations at the 228th American Chemical Society (ACS) National Meeting in Philadelphia August 22-26. Pin1 regulates the protein Cdc25, which initiates mitosis or cell division. Without Pin1, the cell enters programmed cell death -- which is good if it's a cancer cell. Protein shape determines biological function. Pin1 works by changing a peptide bond within Cdc25 from the trans shape (a flattened-Z shape) to the cis U-shape and back. This is a simple change -- the swing of an arm one way or another to open or close the U - results in a large conformation change in a protein. Etzkorn's group synthesized cis and trans shaped inhibitors and introduced them into cancer cells. These inhibitors mimic part of the Cdc25 protein but do not bend to the will of Pin1. The team discovered that cis inhibits the Pin1 enzyme's function 23 times better than trans.

In order to not harm innocent tissue while aggressively treating diseases such as cancer with powerful medicine, scientists have been creating therapy agents that they can activate with light only at the site of a tumor. Until now, almost all photodynamic therapy agents have required oxygen. Yet, tumors are often oxygen depleted. Now, Karen Brewer's research group has developed light-activated therapy agents that are oxygen independent. Karen's group is working with cell cultures to compare the effectiveness of the agents in the dark and in visible light. Using only visible light is a safeguard against inadvertent damage of tissue.

What's New In Chemistry

TEAM ALUMNI AWARD



Barbara B. Bunn and Gary L. Long have received the university's 2004 team Alumni Award for Outreach Excellence.

Bunn conceived of, designed, supervised construction of, and ensured implementation for the first-of-its-kind Mobile Chemistry Laboratory (MCL) outreach program in the United States, a program that operated for eight semesters from fall 2000 to spring 2004. The mobile lab delivers a work area for 24 students and contains high-tech chemistry instrumentation and computers. The laboratory reached from far Southwest Virginia to inner-city Richmond five days per week and included one school that "didn't even have a beaker," Bunn said.



As its traveling teacher, Bunn formed close ties between Virginia Tech and many high-school chemistry teachers by enhancing teacher preparation and expertise in chemistry and taking the high-technology classroom to more than 18,000 students.

Long later became director of the MCL, developing ties to industry leaders and increasing learning and job opportunities for students using the MCL. He created the ChemKit program through which non-instrument-intensive, low-tech chemical experiments are sent out to teachers to support areas of the Standards of Learning (SOL's). Long also started advanced workshops for chemistry teachers.

Through the MCL, more than 60 high-school teachers have received training in five basic workshops since 2001. The MCL was responsible for 32,464 student-conducted experiments in 138 schools over four years. In addition, 11,448 ChemKit student-conducted experiments were done at 66 schools.

The success of the MCL can be measured in part by the gains in SOL scores over its years of operation. On average, participating schools realized a cumulative gain of 37.2 points, compared to a state average gain of 20.7 points.



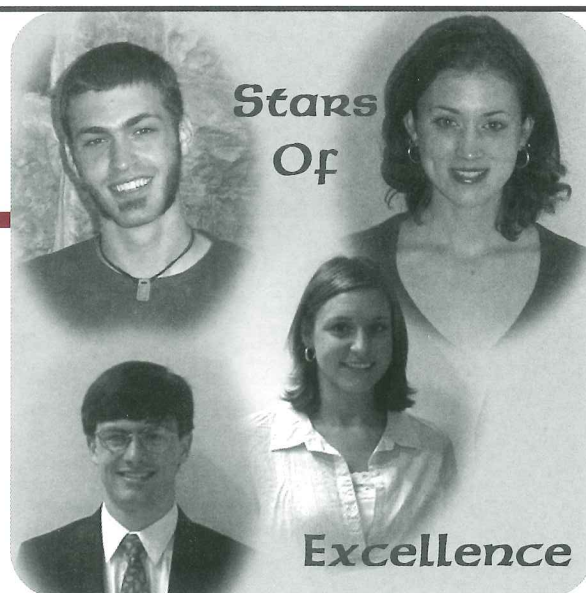
Due to lack of state funding the MCL program was suspended for the 2004-05 academic year.

Student Highlight

Imagine walking through labs in which over 700 students are learning experimental organic chemistry. Students from many places and many cultures who wish to become biochemists, doctors, nutritionists, food scientists, foresters, chemists, biologists, engineers, vets among others. Some are eager to learn, some enter frightened by things they have heard about the course, some just want to finish this course and move on. This is a microcosm of the student world and teaching this course is exciting, challenging and sometimes frustrating. Who are all these students and why do some do so poorly and why do some do so well? And how does one as the instructor with over 20 teaching assistants get to "know" who these students are and how to make this course work? Those are tough questions.

This is Organic Chemistry 2545, the BA Chemistry and non-majors laboratory course which I started teaching two years ago. It is a one unit laboratory course which was recently redesigned and a new laboratory manual was developed by two previous members of the Chemistry department. When I began teaching, the "new" course was established and ready for those never ending modifications. I learned quickly that there are students who come out of the crowd to ask questions, make comments and express concerns. But, these are a small percentage of the total number. One cannot meet many. I did make forays into the labs to try to learn what the students were thinking and learning. As the course went along, every now and then a teaching assistant would mention, "I have this really exceptional student" and then would proceed to describe what it was about the student that made him/her outstanding. In thinking about the grade escalation that has apparently occurred over the years, I started realizing that these incredible achievers really weren't being recognized. This thought came in and out of focus over the course of the next year. Finally, it came to me that we should be honoring and recognizing these unusual individuals.

While jogging one morning, ideas starting crystallizing and I thought we should have a program honoring what I believed were "The Stars of Excellence". These students would be nominated by the teaching assistants (TAs) and only about one percent of all the students would be chosen. I approached Dr. Taylor, then chair of the department, who was extremely enthusiastic and also offered a monetary award from the department for the Stars. You cannot imagine how exciting it was, when after requesting nominations



from the TAs, I received exactly six nominations out of the 600 plus students. I was expecting that all the TAs would think their students were of this level, but somehow the concept was clear - these were students whose grades and achievements shined and leapt above all the others. It was a thrilling moment! My husband Neal, rapidly endorsed the whole concept and not to be left out, chose a Star student from the majors Organic lecture course.

We notified the potential awardees, who all accepted the honor, and then I interviewed each one. What thrilling discussions - the students had such unusual and incredible mental capacity that listening to each one was a treasured experience and all were fine and sharing individuals. Two wish to be medical doctors and one a dentist in rural areas, one is studying to be a chemical engineer, one (how fortunate for the school) is considering teaching high school and one has three majors, Chemistry, Chemical Engineering and Philosophy, who explained that his education is fueled by an interest in metaphysics - a division of philosophy that is concerned with the fundamental nature of reality and being and that includes ontology, cosmology and often epistemology. I wish all of you reading this could talk to these six Stars - the way they think, the way they discuss learning and how they describe their overall philosophies is almost overwhelming. You soon understand that it is not the grade, but the learning that is central to their lives.

These brilliant Stars are: Sabrina Doughty (lab and lecture awardee), Kristin Eden, Adel Ghaderi, Nicholas Newlon, Erik Ritch, and Latasha Sauls - the top one percent. They will be the thinkers and leaders of our society. And we have been privileged to have participated in their education.

Kay Castagnoli

Donors

Appreciation is extended to all alumni, friends, faculty and organizations that have contributed to the Department of Chemistry at Virginia Tech over the years. Your gifts make a difference and can be designated for general department needs or specific programs and scholarships. The following names are donors for the period January 1, 2004 to June 30, 2004.

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A scholarship in your name or the name of a special loved one is a gift that will live forever. You can help our students to become tomorrow's leaders in industry, academia, and medicine. The Department of Chemistry offers scholarships to both undergraduate and graduate students based on academic potential, academic performance, and financial need. For more information on how to create a scholarship for a deserving Chemistry student, please contact Larry Taylor at ltaylor@vt.edu or 540-231-6680.

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The Virginia Tech Department of Chemistry has a long history, a solid reputation and a bright future. Our courses provide the chemical foundation for all Virginia Tech science and engineering students and broaden their understanding about the structure and properties of matter. Our undergraduate and graduate degree programs prepare society's future chemists and scientists. Our faculty's research and scholarships generate and disseminate chemistry knowledge to the Commonwealth, the Nation and the world. And our outreach programs offer opportunities to share this knowledge with others, including practicing professionals, as well as primary and secondary school children. To achieve our mission, the Virginia Tech Department of Chemistry will continue to pursue multi-disciplinary research within and beyond the University, to find innovative ways to instruct students, to forge partnerships with industry and government and to establish a reputation as one of the world's highest ranking chemistry departments.

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