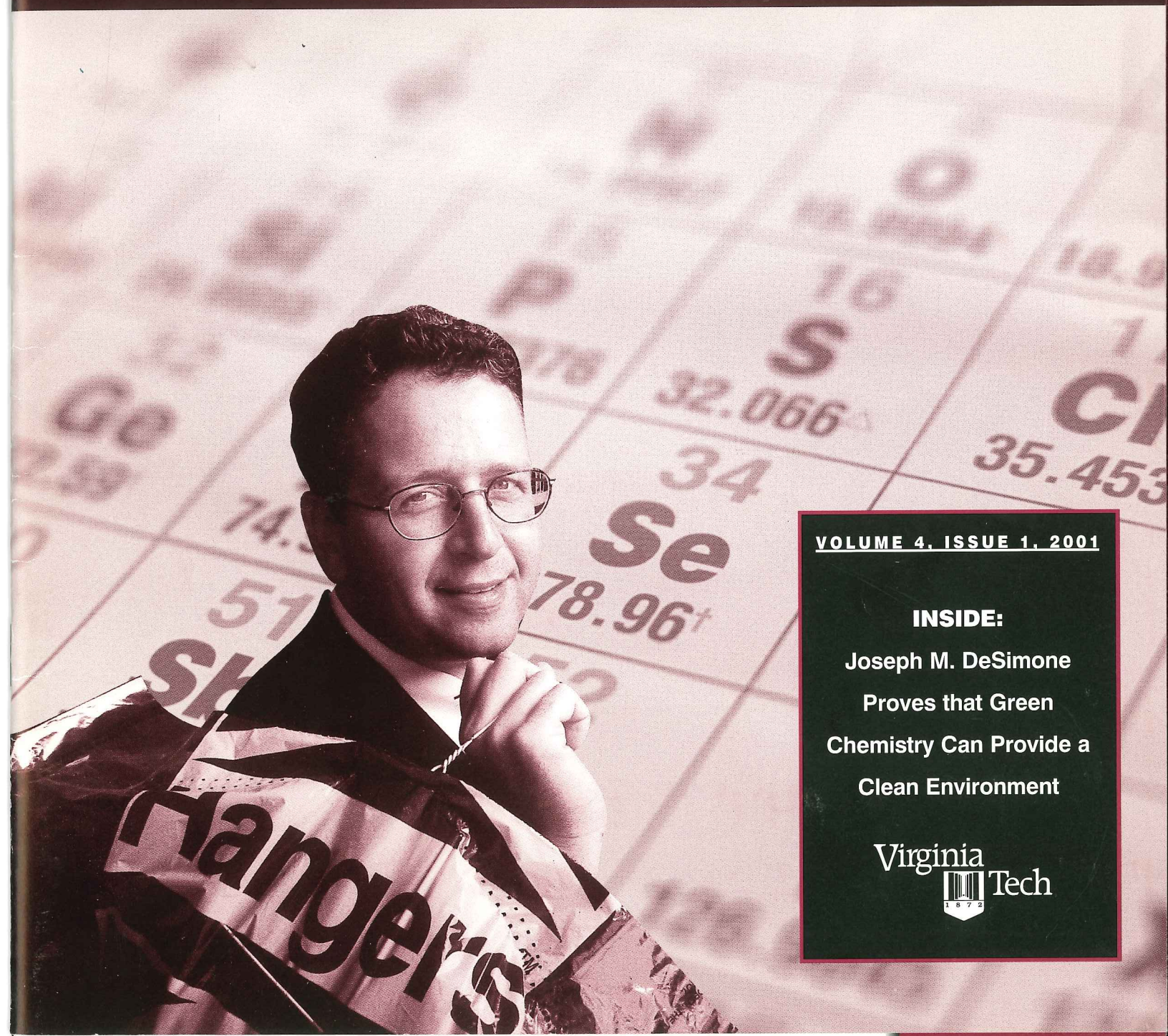


ELEMENTS

The Alumni Magazine of the Department of Chemistry of Virginia Tech



VOLUME 4, ISSUE 1, 2001

INSIDE:

Joseph M. DeSimone
Proves that Green
Chemistry Can Provide a
Clean Environment

Virginia
 Tech

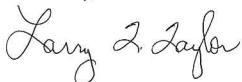
Dear Alumni:

The years are flying by! I cannot believe that I have been department chairman for nearly three years, and that we are preparing for the fourth volume of *Elements*. It is also difficult to believe that people like Harold Bell, Paul Field, John Schug and Jim Wightman have all retired from the faculty during the past year. These persons spent their entire career at Virginia Tech and we are much the "better" for it. Just as the exploits of the Virginia Tech football team are unbelievable, so is the reality that ground will soon be broken for a third chemistry building for teaching. Davidson Hall which was constructed in 1926, will be renovated for chemical research upon completion of the new facility. Unbelievability was further promulgated when the chemistry faculty elected me as their chairman for an additional three years.

As many of you know Virginia Tech gained a new president during the past year, Charles Steger. He has energized the entire faculty with his challenge that Virginia Tech become a top 30 university by the year 2010. Five critical components have been identified for achieving top 30 status as a research university: 1) a motivated faculty, 2) more research space and equipment, 3) more faculty members, 4) more graduate students, and 5) more library acquisitions. As we speak the Department of Chemistry is preparing for its annual graduate-recruiting weekend. This has become a most ambitious effort for us as we feel that excellent quality graduate students are the most important, critical component of a viable research university since graduate students are called upon to both closely interact with undergraduates in teaching laboratory and at the same time provide high quality research results in widely different areas of expertise. The entire faculty and chemistry graduate student body get involved in the weekend. Poster sessions, banquets, breakfasts, graduate mentorship with nights on the town, bowling parties, and small group interaction with faculty are highlights of the 48 hours. I seek your help in bringing chemistry at Virginia Tech to the attention of prospective students. Your financial contributions to the Friends of Chemistry Scholarship Endowment assist greatly in helping us to remain competitive. Equally important to the Department is the attraction of undergraduate chemistry majors to our program. At the moment, we are studying our entire undergraduate curriculum in an effort to keep our graduates as competitive in the "real world" as possible.

As one of only approximately 1,400 chemistry alumni, please know that we in the Department of Chemistry appreciate your choosing Virginia Tech for your formal education. I seek your support in order that our program can more highly excel. Financial contributions to our various educational funds obviously afford needed scholarships, special seminars, achievement awards, professorships, etc. Just as important is your willingness to (a) speak positively regarding your alma mater, (b) provide us with needed worldly advice, (c) serve on our Advisory Council, and (d) re-connect with the faculty/campus. Please plan a trip back to the Department of Chemistry at Virginia Tech and Blacksburg. I bet you will be pleasantly surprised and Hokie proud.

Sincerely,



Larry T. Taylor
Professor and Chairman
Department of Chemistry
ltaylor@vt.edu



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Endowment Honors Alumnus and Wife

One outstanding, undergraduate chemistry student will be the recipient of the first John B. Harvie, Jr. and Sarah Hopper Harvie endowed scholarship in Chemistry. This endowment - based on academic record, financial need, personal character, leadership and community service - is named in honor of the '44 alumnus from the Department of Chemistry, (who retired from Texaco) and his wife.

Short Course Raises Money for Scholarship

A short course organized and presented by Chemistry faculty raised over \$5000 for the Friends of Chemistry Scholarship Endowment. The course, held November 14-17 at Donaldson

Brown Hotel and Conference Center, was entitled "Essentials of Polymer Chemistry, an Intensive, Basic Short Course for Scientists and Engineers featuring:

Synthesis, Sample Preparation, Characterization." Nine faculty members served as course instructors, offering participants what they needed to know on preparation and testing of polymeric samples.

Distance Learning Benefits Incoming Students

During the second summer 2000 session, the Department of Chemistry offered incoming freshman and other first-year-engineering students the opportunity to jump start their college tenure by taking general chemistry for engineers at one of five extended campus learning centers around

Virginia. Students spending their summer in Northern, Eastern, Central and Southwestern Virginia took the 3 credit hour course — taught by Ketan Trivedi, instructor of chemistry — via full-motion, interactive videoconferencing. Course content included principles of the science, character of the elements and their more important compounds, solution of chemical problems and important applications.

Chemistry Faculty Participate in Nanoscience/ Engineering Mini-Conference

Three professors from the Department of Chemistry presented topics at the Virginia Tech Mini-Conference on Nanoscience/Engineering held November 13-14 at the Donaldson Brown Hotel and Conference Center. Organized by the Departments of Chemistry and Physics, the conference sought to raise the awareness of those in the industry about the importance of the collaboration of these two fields.

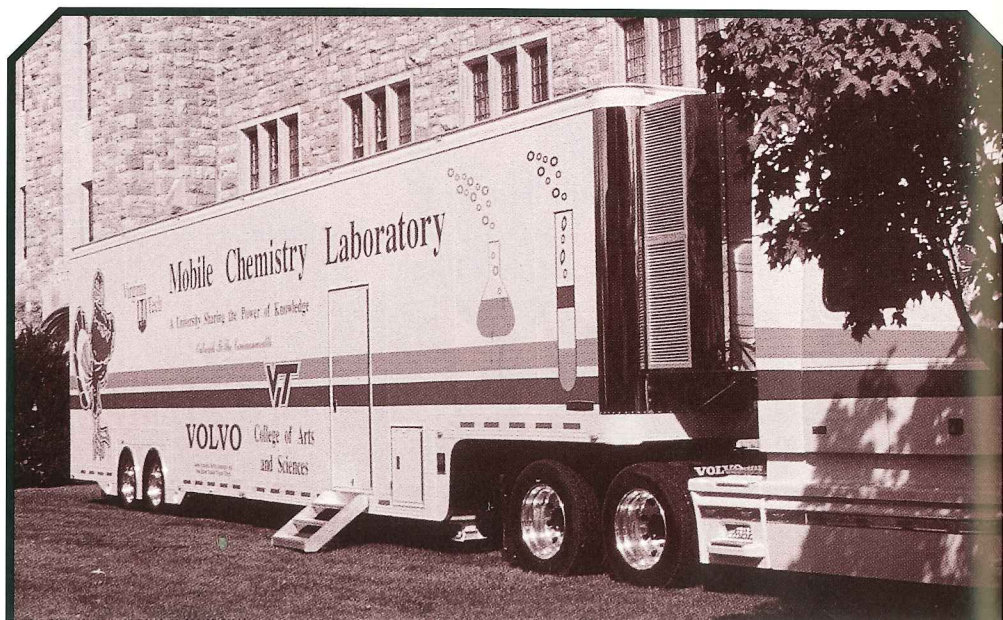
Professor Harry Dorn educated participants about "Nanospheres: Properties and Preparation"; Professor Alan Esker presented "Polymer Transport through Ultrathin Membranes"; and Professor Tom Ward, talked about "Surfact Assemblies of Microphase Separated Block Copolymers."

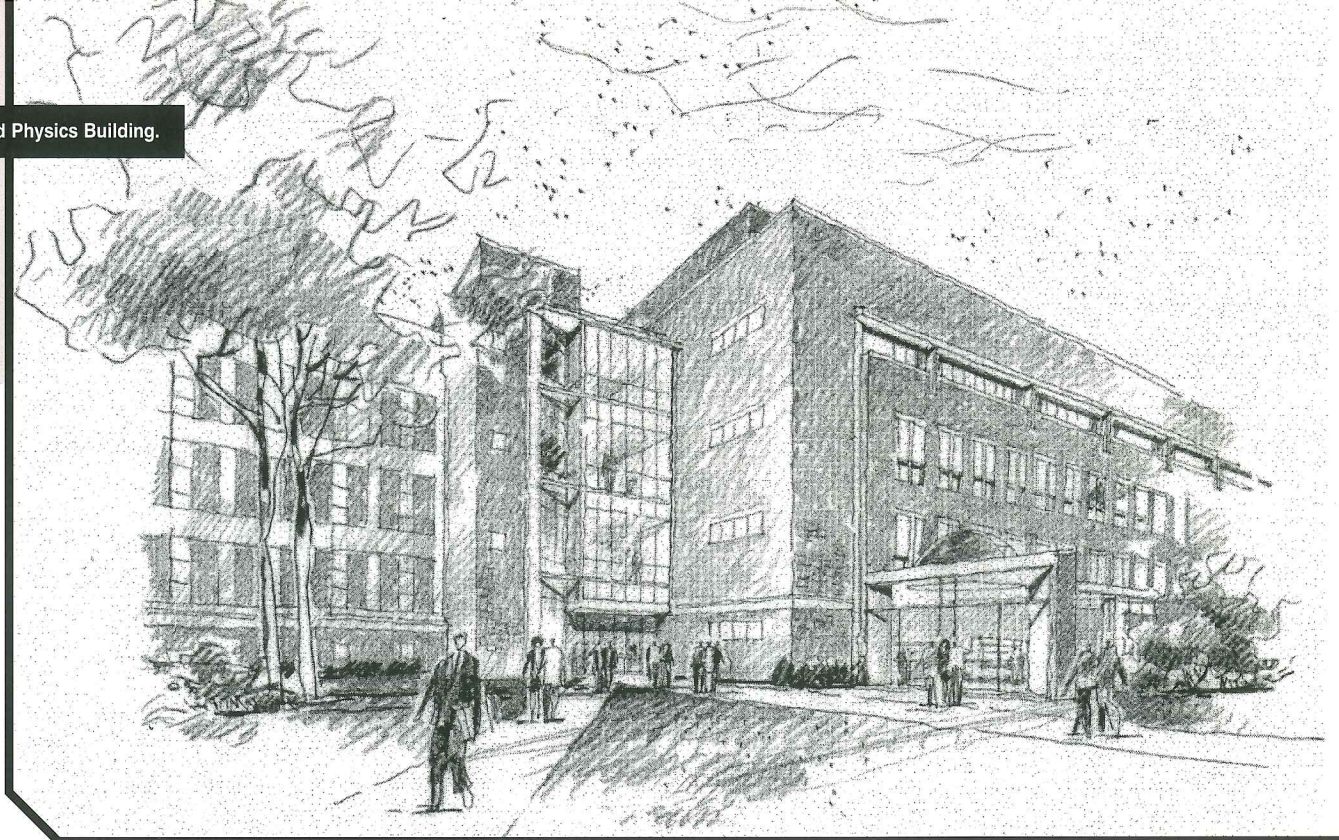
Class Offers Students Insight to Life after College

Scientific Professionalism, a seminar class taught by Paul Deck, professor, is giving students a look into their futures. Available to both undergraduate and graduate students is a series of lectures, guest speakers and workshops on matters such as professional development, ethics, career pathways, financial analysis and business opportunities. Deck invited Virginia Tech alumni and other distinguished guests from throughout the university and industry to talk to his class on various topics and advise. Topics included interviewing and mock interviews, introduction to professional and scientific management, and careers in the government and military.

Department Offers Summer Workshops

A series of three professional workshops have been approved and funds have been secured. Virginia Tech instructor Carla Slebodnick will lead workshops, including one to be held June 25-29 at Longwood College (tentative) for teachers outside the Mobile Classroom Laboratory's target region who want to learn new classroom activities. July 9-13 a workshop will be held at Virginia Tech for last year's Abingdon participants. And a third workshop will take place July 23-August 3 at the University of Virginia (tentative) which will be similar to last year's Abingdon workshop.





Did you know ... Virginia Tech's Chemistry Department Had One of the First Student Affiliate Chapters in the U.S.

Virginia Tech's student affiliate chapter of the American Chemistry Society is regrouping and recharging under the guidance of faculty Carla Slebodnick and Jim Wightman. But its history is strong. In fact, chemistry alumnus Richard Greiner contacted the Department to let them know that Tech's chapter is one of the oldest in the nation. That's right. In 1937, seven universities chartered student affiliate chapters of the American Chemistry Society and Virginia Tech was one of those founding seven. J. W. Watson was the group's faculty sponsor.



Update on New Chemistry and Physics Building

Despite various budget cuts and funding freezes, the Chemistry and Physics Departments remain optimistic that construction will begin on their new building this summer as originally planned. If construction moves forward as scheduled, the state-of-the-art building — with ample lab space and lecture theatres to ease the overcrowded science buildings — will be complete and ready for move in, August of 2003.

Memories of a Distinguished Alumnus

Landon Selby, who earned his B.S. in chemistry (in 1931) and M.S. in chemical engineering from Virginia Tech, is a well-remembered alumnus. He came from a wealthy family — his father ran the Liberty Milling Co. and the brand name Washington Flour. As late as 1950 Selby's father owned the town of Germantown, Md. Choosing to forge his own route and make his own money, Selby chose to serve his career at duPont.

Two Graduates Share Their Perspectives on Facing the Real World

by Beth Pullin

Flowers are blooming and popping up all around campus, and the walk across the drillfield is much warmer. Spring is in the air and visions of summer vacation begin to fill students' minds. But for others, the season signifies something bigger — graduation and a world of opportunities that lie ahead. A graduate and undergraduate student, share their thoughts about chemistry and life after college.

Matt Thornberry, a fourth year graduate student, discovered his capabilities in chemistry during his undergraduate years at James Madison University (JMU). Now, he plans to get married, receive a PhD in chemistry and leave the friendly atmosphere that attracted him to Virginia Tech for the unknown fears of the working world.

Q. How and or why did you choose to pursue a degree in Chemistry?

A. "As an undergraduate at James Madison University, I started taking chemistry courses because I was good at the subject in high school. I also liked English and took some classes. But I did better in chemistry, continued to do well and when I started doing actual research outside of the classroom, I really became interested and knew I wanted to keep going in that direction."

Q. How do you plan to make a difference with your education?

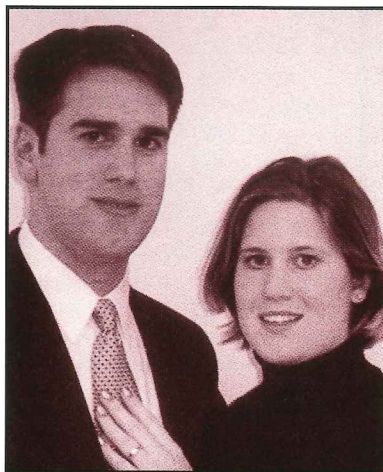
A. "It depends upon how you define difference. I'm certainly not out to win the Nobel prize, although if it happened it would be great. For me it means being satisfied with the work I do — a personal feeling when I come home at the end of the day that I enjoy what I do. I'm so young now it's hard to know what I can accomplish but I feel good about what I've done ... having earned a Ph.D. by age 25. Now I won't have to worry about finding a balance between school, family and other obligations."

Q. How do you plan to use your degree?

A. "I'd like to pursue industry and do research and development for a large company and stay clear of academia. I want to see how things are done in the working world. I think down the road I'd like to end up at a school the size of JMU or William and Mary and teach. In my experience, many professors haven't made the leap from the working world to academia. I'd like to be a professor who can offer students different perspectives. I also think there's a need to have teachers who speak clearly and can simplify the language in order to explain it."

Q. What are your goals and dreams?

A. "I'd like to have a balance between family and work. My first major priority is to have a good family life and maintain it. Eventually, I'd like to be a teacher. I want to do just enough to keep myself satisfied and think some people take work too seriously. They get bogged down with their careers and their family life suffers."



Matt and fiancée Andrea Yardley.

Q. What are your interests and hobbies?

A. "Sports. I try to stay active and enjoy meeting others. I also enjoy travel and try to visit new places. Of course in graduate school there's not much time for hobbies outside of chemistry."

Q. What do you feel has been the greatest thing about going into chemistry?

A. "One of the neatest things I've been able to do is teach. I've taught general chemistry lab and an organic chemistry lab. And I can't stress how important communication is. I try to throw in real life tidbits like 'Why does the bottle say toxic?' and when you see the students make the connection, it's great and makes me feel happy. I was also able to go back to JMU and tell students about graduate school. I was able to share with them the details no one told me. It was an enlightening experience for me and them. And I spoke to the Alumni Advisory Committee to share my feelings about graduate school ...what attracted me, what could use improvement."



Dave Chung, a senior from Northern Virginia, realized his interest in chemistry through an extraordinary teacher in high school. The positive influence of his high school experience led to more and more classes at Virginia Tech until he was "hooked." Now he is weeks away from graduation, with hopes of working in the chemical industry.

Q. How or why did you choose to pursue a degree in chemistry?

A. "I had a good teacher in high school. At Tech, I took classes and wanted to see how far I could go. I got more and more into it and now it's my life."

Q. How do you plan to use your degree?

A. "I want to pursue organic synthesis. It's exciting to think about how I may be able to help people by treating diseases."

Q. How do you plan to make a difference with your education?

A. "In industry nowadays there are discoveries related to man. The human genome is being used to come up with new discoveries. By having a copy of the blueprint of our DNA, it helps speed up the process to find the roots of disease. I would like to do something similar in medicinal chemistry. I want to have a hand in making discoveries to help treat people."

Q. What are your goals and dreams?

A. "On a personal level, I want to continue what I'm doing. I want to maintain a

balance between work and play and help maintain a happier and healthier lifestyle."

Q. What are your interests and hobbies?

A. "I play recreational sports ... football on the drillfield, ultimate frisbie and volleyball. I'm also active with the chemistry fraternity, Alpha Chi Sigma and the Chemistry Club."

Q. What do you feel has been the greatest thing about going into chemistry?

A. "A lot of doors have opened ... more than I ever expected. I've also learned that when I do good work, it gets recognized. I get a great deal of satisfaction from knowing that people are looking at chemistry majors like myself for future jobs. I have the Chemistry Department to thank. They've been very good to me. I had the opportunity to speak to the Chemistry Advisory Board. I've done undergraduate research with some of the professors. Really, my educational experience has been more than taking classes. It's being what you want to be. I would choose this above all else."



*"I'd like
to be a
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who can offer
students different
perspectives."*

—Matt Thornberry

*"A lot of doors
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PEOPLE IN THE NEWS

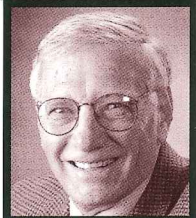
Elizabeth Bullock, a graduate student, is using molecule groups known as polyazine ligands to connect two metal based molecules. She links a unit that can collect light and a unit that collects electrons.



Thomas E. Glass, Nuclear Magnetic Resonance laboratory supervisor, received the Chemistry Department's Staff Award.



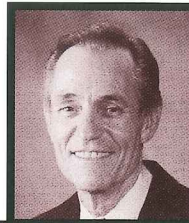
T. Daniel Crawford, assistant professor, has received the Research Corporation Award of \$35,000 for his proposal "Basis Set Diagnostics for Quantum Chemistry." In addition, he was awarded the Camille and Henry Dreyfus New Faculty Award for 2000 which includes a \$40,000 grant to support his research.



John Dillard, professor, has won the 2001 Robert L. Patrick Award at the 25th meeting of the Adhesion Society in Williamsburg for significant contributions in his field.



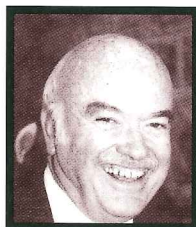
Neal Castagnoli, Harvey W. Peters Professor of Chemistry in the College of Arts and Sciences and Eminent Scholar of the Commonwealth of Virginia, was one of two scientists named as Virginia's Outstanding Scientist of 2000. Top honors are made each year by the Science Museum of Virginia and the Commonwealth of Virginia. Neal Castagnoli, director, and Kay Castagnoli, senior research associate of the Harvey W. Peters Center in the Chemistry Department, identified a compound in tobacco that may protect against the development of Parkinson's Disease.



Harold M. McNair, professor, contributed the first HPLC short course at the University of Messina last June and has won the Year 2000 Calvin Giddings Award from the analytical division of the American Chemical Society for his outstanding teaching and research contributions.



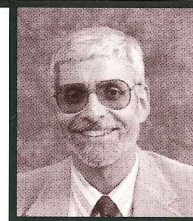
Thomas E. Bell, chief administrative officer, received the Chemistry Department's Alan Clifford Award for continued and outstanding service to the department.



Jim McGrath, distinguished professor and Ethyl Chaired Professor, won the Chemistry of Thermoplastic Elastomers Award presented by the American Chemical Society's rubber division. He has also received an IBM Faculty Partnership award for \$40,000, as well as another grant from the National Science Foundation to help fund his materials for advanced fuel cell applications project.



David Kingston, distinguished professor, attended the 22nd International Symposium on the Chemistry of Natural Products in Sao Carlos, Brazil to give a lecture. He has also been selected by the Department of Health and Human Services to serve as a member of the Bio-Organic and Natural Products Chemistry Study Section for the Center for Scientific Review.



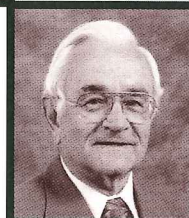
Harry C. Dorn, professor, was the keynote speaker for the Electrochemical Society's Fullerene Symposium in Washington, DC in March. He also co-authored two papers that appeared in *Nature*.



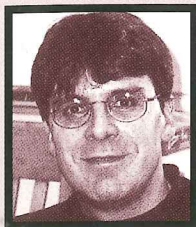
Joseph Merola, associate dean of research and outreach in the College of Arts and Sciences, has been promoted to acting dean of the Virginia Tech graduate school.



James P. Wightman, honorary alumni and distinguished professor, has been selected by the State Council of Higher Education in Virginia to receive the Outstanding Faculty Award for 2001. He was one of 10 college and university faculty members across the Commonwealth to be selected and was presented the award by Governor James Gilmore at the state capitol.



Karen J. Brewer, associate professor, was presented the College of Engineering and Science Young Alumni Award by Clemson University for her outstanding career accomplishments and contributions to science.



Tim Long, assistant professor, has received a 3M untenured faculty award which includes a \$15,000 annual grant. Additionally, he has received a grant funded by Agriculture Human and Natural Resources to foster distant education initiatives. The funds will be used to create a virtual tour of the macromolecule-biomolecule interface for a web-based class.

Jimmy W. Viers, associate professor, was quoted in Chemical and Engineering News, regarding the current job market for new chemistry graduates.



Janice Paige Stevenson, instructor, has co-authored two laboratory manuals for a two-part organic chemistry laboratory course.



Paul R. Carlier, associate professor, and his coworkers have designed a hyperzine A-like drug that is more potent than the natural product and could lead to the development of a treatment for the type of memory loss experienced in the early stages of Alzheimer's disease.

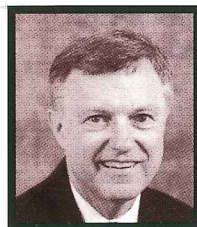


Herve Marand, professor, has joined the editorial advisory board of the *European Polymer Journal*.

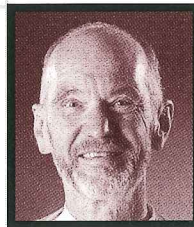


John Morris, assistant professor, has received a \$150,000 award from the Army, through the Defense University Research Instrumentation Program to purchase a reflection absorption infrared spectrometer. He has also received a Career award from the National Science Foundation for studying the reactions of environmental pollutants on surfaces.

Jianli Wang, a graduate student, placed second in the Alan Gent Best Student Paper Award sponsored by Loctite. The Best Poster award was given to Wang, who also won a Peebles Travel Scholarship Award to attend the meeting.



Larry T. Taylor, Professor and department chair, visited several places in Asia, including Seoul, Korea; Beijing, China; Bangkok, Thailand and Hong Kong to lecture and consult on supercritical fluid technology. The trip was sponsored by Isco Inc. of Lincoln, Neb., the only major manufacturer of commercial analytical supercritical fluid instrumentation in the world.



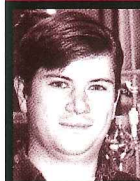
Ray Dessy, professor emeritus, will receive the Distinguished Alumni Achievement Award from the University of Pittsburgh at their Alumni Weekend in June, 2001. He is honored for his research publications, graduate student mentoring, pharmaceutical consulting, contributions to analytical chemistry publications, national and international short course education, and other national professional services. In addition, he spoke on chemical e-preprints at a Washington, D.C. American Chemical Society meeting. Additionally, Dessy will serve on the advisory board for the Chemistry Preprint Server, a freely available and permanent web archive and distribution medium for research articles (www.chemweb.com)

Faculty Changes:



Three Retire

Harold M. Bell, associate professor emeritus; John C. Schug, professor emeritus; and Paul E. Field, associate professor emeritus, were honored for their dedication to the Chemistry Department at a retirement dinner in December. They served the University for a combined total of 103 years.



Three Earn Promotions

Paul Deck, William Ducker and Tim Long have been promoted to associate professor with tenure.



Three Join Department

Paul R. Carlier, associate professor; T. Daniel Crawford, assistant professor; and Felicia A. Etzkorn, associate professor, have joined Tech's Chemistry Department. Carlier, holds a B.A. from Hamilton College and a Ph.D. from MIT and specializes in organometallic and bioorganic chemistry. Crawford earned his B.S. from Duke University, his Ph.D. from the University of Georgia and served the University of Texas as a postdoctoral research associate. His area of specialty includes theoretical and computational chemistry. Etzkorn earned her B.S. from Southwest Missouri State University, a Ph.D. from the University of California at Berkeley and worked as a National Institute of Health postdoctoral fellow at Harvard Medical School. She specializes in bioorganic chemistry.

Joseph M. DeSimone Proves that Green Chemistry can Provide a Cleaner Environment

By Tamasin Roop

Joseph M. DeSimone, the 2000-2001 Outstanding Young Alumni for the College of Arts and Sciences, is a green chemist. But he is also much more. He is a man with a mission: inventing, patenting and commercializing technologies that reduce society's reliance on chlorinated organic chemicals.

"Green chemists find better ways to do things — for environmental sustainability," he explains. "I believe it was Einstein who said that we cannot solve today's problems with yesterday's knowledge base. Chemists are associated with creating problems, and chemistry and chemical engineering also can solve problems." In addition, DeSimone is a teacher, an entrepreneurial businessman and a collaborator with some of the best thinkers and doers in industry and academe.

DeSimone's pioneering work is creating a knowledge base that contributes to environmental sustainability directly and significantly. His research has centered around the use of carbon dioxide to eliminate the need for toxic solvents without sacrificing water. In the early 1990's, DeSimone and two of his graduate students achieved a long-pursued scientific goal when they invented detergents that could be used effectively in pressurized, liquid carbon dioxide.

"I think there is an extraordinary future for the entire carbon-dioxide platform to mitigate society's dependence on organic solvents and water," he says.

Born in Norristown, Penn., DeSimone, 36, became aware of the imbalance between nature and business early.

"Due to local contamination of our water wells from manufacturing solvents, my family grew up drinking bottled water as a precaution," he told the U.S. House of Representatives' Committee on Small Business last summer.

DeSimone is a full-speed-ahead kind of guy — a necessity, given his many roles. He is a William R. Kenan, Jr. Distinguished Professor of Chemistry and Chemical Engineering at the University of North Carolina at Chapel Hill and professor of Chemical Engineering at North Carolina State University in Raleigh.

He also serves as director of the new National Science Foundation (NSF) Science and Technology Center for Environmentally Responsible Solvents and Processes. And he is chairman of Micell Technologies, Inc., a Raleigh-based business he and two former graduate students founded in 1995 to take their "green inventions" to the marketplace.

Micell Technologies' first application of the liquid-carbon-dioxide cleaning process was Micare, a

patented dry-cleaning system, which replaces traditional solvents such as perchloroethylene that are harmful to the environment. The system is delivered commercially through Micell's Hangers Cleaners franchise, which now has 50 retail locations in five states. More than 100 retail locations are expected to be operating by the end of the year.

Micell also invented and markets Miclean, a system that cleans metal surfaces using liquid carbon dioxide and special detergents rather than halogenated solvents or water.

Both the Micare and Miclean processes recycle and reuse the liquid carbon dioxide and detergents they use. The company also has developed water and stain-repellent fabric finishes. These innovations recently earned Micell the 2001 Governor's Award for Entrepreneurial Excellence, presented by the North Carolina Technologies Development Authority, Inc.

So what's next for Micell?

DeSimone answers this way: "I am very excited about the use of carbon dioxide in the microelectronic industry. We are using carbon dioxide to replace water and organic solvents in the manufacture of integrated circuits."

Scientifically, DeSimone is proudest of the commercialization of his invention of a process that uses carbon dioxide in the manufacture of Teflon instead of chlorinated chemicals or millions of gallons of water requiring post-production treatment. DuPont currently is building a \$40-million pilot plant in Fayetteville, N.C., which will use the process to produce Teflon. If it is as successful as expected, DuPont will expand its facility with about \$200 million in additional investments over the next six years.

DeSimone also is rightfully proud of the new National Science Foundation Science and Technology Center (NSF). It will be the leading facility in the world dedicated to



discovering environmentally friendly processes using alternative solvents, he says. Expectations are that it also will be a model of cooperation among universities and between industry and academe. The center is anticipated to bring in from \$35 to \$40 million in NSF funding over approximately 10 years.

After DeSimone earned his undergraduate degree in chemistry at Ursinus College, it was his interest in polymer research that steered him to Virginia Tech's Department of Chemistry for his Ph.D.

"It was the leading program in the country," he explains. In particular, he wanted to study with James E. McGrath, now University Distinguished Professor. McGrath became his mentor, was his Ph.D. advisor and had a decisive impact on his professional life. "He is an extraordinarily talented and supportive individual," DeSimone notes, adding, "I owe my success to him." DeSimone cites others in the chemistry and chemical engineering departments as inspiring him, in particular Harry W. Gibson, Larry T. Taylor, Thomas C. Ward, James P. Wightman and Garth L. Wilkes.

His years at Virginia Tech also profoundly affected DeSimone's teaching and research.

"The faculty there are extraordinary teachers and researchers so I always felt that if someone could be one-tenth of the teachers they are, they would also be great teachers and be extraordinary," he remarks.

DeSimone, who considers "cross collaboration" among educational and industrial institutions and colleagues as vital to research and innovation, was first involved in the approach at Virginia Tech.

"The traditional ways of training students have been one-on-one with little collaboration," he says. "My collaboration started with graduate school at Virginia Tech where the faculty are extremely collaborative. They set a good

example for me." He has collaborated regularly with the members of his own graduate-student research group, called "The DeSimone Group", which is modeled after what Jim McGrath did at Virginia Tech, he says.

While he has had outstanding success as a researcher and businessman, it is his students and teaching green chemistry that mean the most to DeSimone.

"My philosophy is that chemists need to think of themselves more broadly than they do today," he says. "Freshly minted chemists tend to put themselves in a box. I encourage new chemists to think more broadly about how to use their science and I give them vehicles for doing that."

DeSimone considers the achievements of his students his greatest career accomplishment.

"My students are number one. I appreciate how well they have done in industry and academia and the imprint I have had on them in relation to how they do science." As an example, he cites several of his former graduate students who collaborated with him in his early research and who now are in leadership positions at Micell Technologies.

DeSimone's research and collaborative efforts have produced a multitude of accolades and awards. *Business Week* and the journal *Science* have recognized him as the leading researcher in liquid-carbon-dioxide surfactant development and *The New York Times* has called him "a Wunderkind of chemical engineering." Among his awards, it is the 1999 Carl S. Marvel Creative Polymer Chemistry Award that has the most meaning, he says. "It is the highest honor for a young polymer scientist and the one I am proudest of. The faculty at Virginia Tech were the inspiration to me." He also has received the Presidential Green Chemistry Challenge Award and a 1998 R&D 100 Award for one

DeSimone

considers

"cross collaboration"

among

educational

and industrial

institutions

and colleagues

as vital to

research

and innovation

continued on page 15

Harold Bell: A Continued Love for Education Makes Retiring Difficult

By Bethany Johnston

It has been said that education is a life-long process. That as long as our minds remain open, learning never ceases. And perhaps this is the best way to describe Harold Bell, associate professor emeritus of chemistry.

As someone who grew up the child of two teachers, became a teacher himself, married a teacher and had a son who now teaches, education is not only in his blood, it is his life.

So it's easy to understand why Bell couldn't quit teaching cold turkey. Rather he is, in his words "gradually retiring." This gradual retirement began in 1998, his official retirement year. From '98 to the end of 2000, Bell taught half time. And this upcoming summer, he will teach organic chemistry, something he is considering for future summers as well.

Bell's long and successful life of learning began in south central Kentucky in a small town called Monticello. Both parents were teachers in the public school system. In 1956, Bell headed off to the University of Kentucky. It was there that he discovered his love of chemistry.

"I started off at UK as a physics major, but I liked freshman chemistry so much that I changed over to a chemistry major and stuck with it," he explains.

He transferred to Eastern Kentucky University (formerly Eastern Kentucky State College) in 1957, thinking that he might become a high school chemistry teacher.

Chemistry was not the only thing Bell pursued at ESU. He also met a

young woman named Verena LaFuze, and the two married shortly after they graduated.

The newlyweds headed to West Lafayette, Indiana in 1960 so that Bell could continue his chemistry education at Purdue University. Verena taught in the public school system. In 1964, Bell earned his Ph.D. in physical organic chemistry under the direction of Nobel Laureate H. C. Brown.

A two-year Army obligation that had been on "hold" since 1960 was fulfilled in a rather pastoral setting near Colorado Springs, Colorado. While in the Army, he was part of a team that worked on an early version of Star Wars research.

After two years in Colorado, Bell began to look for a job in civilian life. The time at Purdue convinced him that an academic tenure was in his future.

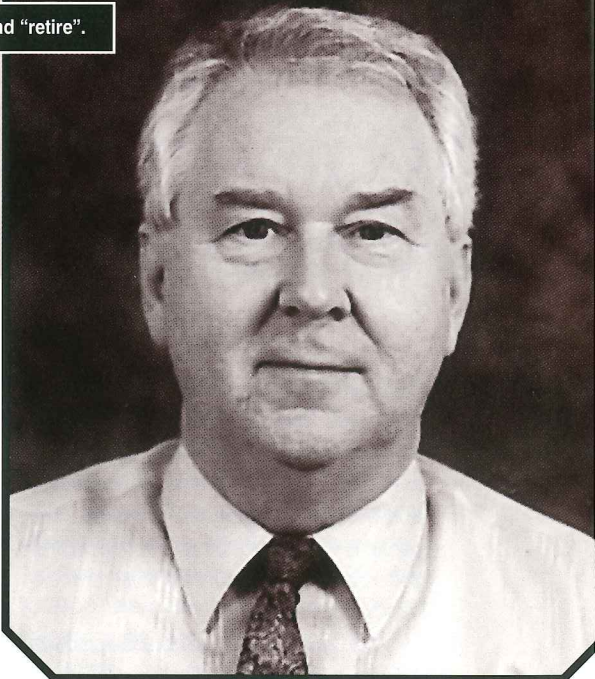
"I realized that I wanted to go into academia instead of industry," he says. "Academics seemed to offer a freer and more pleasant way of life."

Having heard about Virginia Tech while in the Army, Bell decided to send his resume to Blacksburg.

"Much to my surprise, Alan Clifford — who had recently been hired as the chemistry department head (and who coincidentally served on Bell's Ph.D. committee at Purdue) — answered my letter and offered me a job," Bell says.

So Bell began his academic career at Virginia Tech in 1966 as an assistant professor. His time spent at Purdue instilled a commitment to the importance of undergraduate education, and he continues to remain true to that commitment.

"At most large universities, an emphasis is always put on graduate programs," he explains. "At Tech it was not that way. We tried to make sure



that undergraduates got the necessary attention to make them feel that they were an important part of the department."

This dedication to undergraduate excellence is perhaps what propelled him to the spot he held for 18 years as director of undergraduate studies. In this position he was responsible for recruiting undergraduates, advising a large number of undergraduates and maintaining day-to-day activities of the undergraduate program. And his efforts have not gone unnoticed or unrewarded.

In 1985 he received the Alan F. Clifford Service Award from his peers in the chemistry department; in 1993 he received the Ivey F. Lewis Distinguished Service Award from the Virginia Academy of Science; in 1997 he was awarded the Virginia Tech Career Advising Award; and his most recent award came in April when he was inducted into the Academy of Advising Excellence.

Bell is particularly proud of his advising awards.

"Seeing my students grow and develop brings me great satisfaction," he says. "Knowing my mentoring had something to do with their success means a lot."

And while many university faculty despise teaching lower level labs, it is what brings Bell the most joy. In fact, he never stopped teaching lab classes. His first lab class (Identification of

Organic Compounds, IDOC) had 12 students, and his largest exceeded 100 students. And after 35 years of teaching, Bell has probably taught IDOC to more undergraduate students than any other professor in the country.

Another impressive accomplishment is the legacy that Bell has left for chemistry students and scholars all over the world. From his days conducting Star Wars research, Bell developed an interest in computing and used that influence to design chemical software.

About 10 years ago, he began to develop software for simulation of several of the more popular FTNMR experiments. Today the software, which is made available at no cost on the department's web site, is being used around the world by those involved in teaching and doing NMR. Bell says that this work will continue for several more years. At present, with the help of a friend in Mexico City, he is working on Spanish language versions of the software. This will make the simulations much more useful to a large segment of the non-English-speaking world.

The academic lifestyle that Bell aspired to over 40 years ago has paid off in the office and at home as well. He and Verena have two children who, taking after their parents, developed a love of learning. daughter Karen works as an engineer in

Indianapolis, and his son, Leonard is a food chemist on the faculty at Auburn University in Alabama.

And now that his duties at Virginia Tech are gradually beginning to wane, Bell can take more time to do the things he loves.

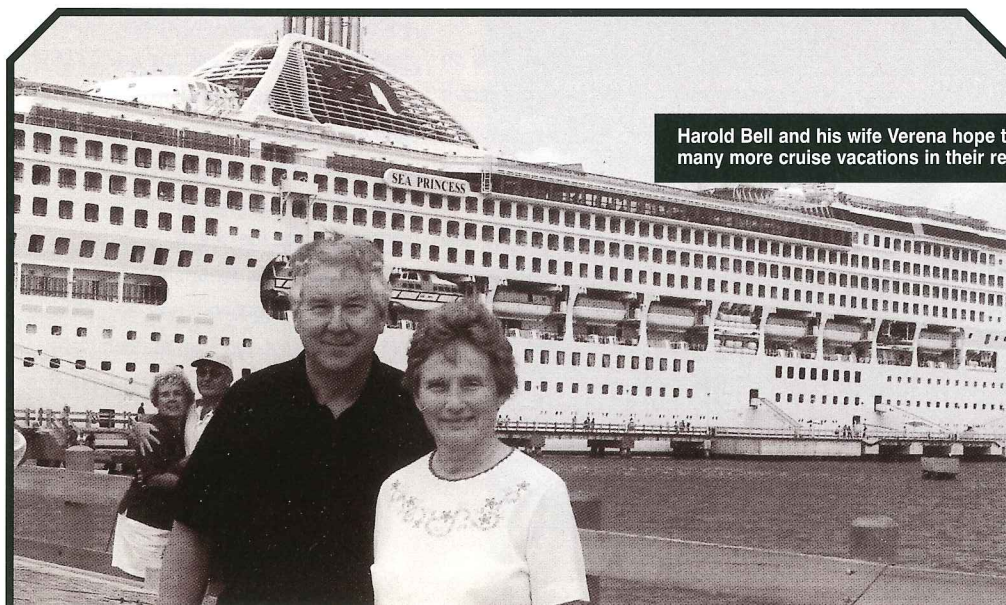
He and Verena love to travel. They have their sights set on some more cruising, and traveling within the United States, especially to the Southwest. The two also plan to make more frequent trips to visit their children and three grandchildren.

Bell will teach this summer and probably for summers to come, because as he puts it, "I'm new at this retirement thing, I can't completely slow down."

The Bells have plans for their time in Blacksburg as well. They are avid ballroom dancers and members of the New River Dance Club, where they participate in monthly dances.

Bell also has a particular passion for toy trains. He got his first train set in 1951 and in 1978 began collecting seriously. The less expensive trains are often put out for display during the holidays, but he keeps tight reins on the more expensive ones.

And while there is plenty to keep Bell busy outside of his Virginia Tech office, if his continued energy for teaching and learning is an indicator for the future, his gradual retirement is likely to continue — as stated — gradual.



Harold Bell and his wife Verena hope to go on many more cruise vacations in their retirement years.

FACULTY PROFILE



Professor's Key to Success? Keep it Basic.

By Bethany Johnston

The fundamentals. The basics. The how and the why. That's what Professor James Tanko focuses on, lives for, researches and applies to his daily life.

As a 15-year-veteran faculty member at Virginia Tech, he has been an integral part in answering a lot of how's and why's in the field of chemistry, and strives as a teacher to inspire his students to answer new questions and problems. That is his education focus and philosophy.

"My teaching is problem oriented. More than just lecturing and having students take notes," Tanko says. "We know the answers to many of the questions that have already been asked. I want to prepare my students to answer the questions that have not been answered, or even asked yet."

Tanko believes that the strength in the Chemistry Department and in his teaching, is the strict adherence to the instruction of the fundamentals of chemistry and of science in general.

"What I teach and the type of research we are involved in does not produce a product, per se," he explains. "Rather, we contribute to the understanding of how things work which eventually leads to figuring out problems and developing products."

As a teacher, Tanko prides himself on giving his students his all. He enjoys the effort involved in preparing for a class lecture; it gives him a charge.

"Something about preparing for classes

is very invigorating," he says. "You have to learn and re-learn material. You have to take your knowledge to a higher level."

He even offers his graduate students weekly review sessions to go over covered material, work problems and answer questions.

"I love interacting with the students. It is satisfying to have students figure out a problem and see that sparkle in their eyes where you know you've reached them and made something clear."

Granted Tanko is dedicated to giving students his time, energy and effort, but make no mistake, his classes are not cakewalks. He readily admits that he's tough. He expects reciprocated energy from his students and likes to use exams, not only as an evaluation method, but as a learning tool as well.

And while Tanko is devoted to his students, he refutes the idea that they are customers who should be coddled and pampered.

"I view students as our product. And if they are a customer then I see myself as their aerobics instructor. An aerobics instructor who will whip them into shape and get them prepared for life, not one that will let them get fat and lazy."

There is a reason why Tanko feels so strongly about high expectations. In fact, it was the demanding organic chemistry class that he took while an undergraduate at the University of Maryland-Baltimore County (UMBC) that served as the catalyst for his chemistry education and career.

It's no secret that in high school, the young Jim Tanko was neither a stellar student, nor highly motivated. His high

school physics teacher even went so far as to say that he wouldn't make it out of college. But that all changed when Tanko entered his freshman year at UMBC. He did well, began taking chemistry courses and started thinking seriously about chemistry as a major.

But the course that sealed his fate, so to speak, was organic chemistry.

"It was a rigorous and demanding course," he recalls. "And I loved it."

After completing his bachelor's degree in chemistry at UMBC, Tanko headed to the Midwest — Ames, Iowa — home of Iowa State University (ISU) and enrolled in the Ph.D. program.

During his tenure at ISU, Tanko had the privilege of studying under Glen Russell, a pioneer in the field of free radical chemistry. His research focus and project dealt with the aromatic S_N1 reaction. This reaction is a free radical chain process, the key step of which involves coupling of a radical and a nucleophile.

After a two-year post doc stint at the Pennsylvania State University with professor Phillip Skell, Tanko began looking and applying for teaching positions. His search criteria, however, had as much to do with the quality of life of the area, as it had to do with the university. As an avid hiker and outdoorsman who spent five years in flat, land-locked Iowa, he knew he needed to be near the mountains and the ocean.

Virginia Tech fortunately passed his tests. Not to mention it was also close to his favorite spot, the Shenandoah National Park. So when he was offered a position, (in his words) he couldn't say yes fast

Left: Tanko and wife, Linda enjoy a beautiful day in Blacksburg.
Right: Jennifer Tanko takes a break from canoeing on the New River.

enough, and in 1986 began working in the Chemistry Department as an assistant professor. In '92 he received tenure, and in '98 became a professor.

And in the nearly 16 years that Tanko has been with Tech, he has taught organic chemistry every year, the very class that inspired his hard work and dedication to the field of chemistry.

But that's not all. He is involved in several research projects, most of which involve the chemistry of free radicals and radical ions. A number of kinetic techniques are applied, including electrochemistry and laser flash photolysis. Also, Tanko has examined the chemistry of free radicals in supercritical fluid solvents.

Tanko is happy with his academic lifestyle at Virginia Tech. It offers him the perfect mix of structure with freedom and flexibility...something he could not get working in industry. The money may be better working for a major company, he will admit, but the intangible rewards as a professor and researcher are hard to beat. Tanko says he feels like it's the chance to be his own boss and control his own destiny.

"In the classroom and in research you fail or succeed based on your own merit," he says. "You are judged by what you accomplish, not the hours you keep."

But certainly with the independence and freedom comes a price. And that comes in the form of funding, which can be a major frustration and challenge. Tanko says he has been blessed on several research endeavors with funding from the National Science Foundation, but it is a constant, never-ending battle to ensure that the department and his research continue.

"You can chart your own course, but you have to convince people to pay for it," he says.

One thing that the flexibility of academia has maintained and strengthened is Tanko's

time with his family, which he calls priority number one. He and wife Linda have a 13-year-old daughter Jennifer. The three enjoy the basic, fundamental pleasures of being together and spending time outdoors camping and hiking.

Tanko takes part in extracurricular activities on his own as well. He prefers the more challenging, daylong hikes on the Appalachian Trail. But he hates crowds, so you won't find him hiking some of the popular Southwestern Virginia spots on a Saturday afternoon.

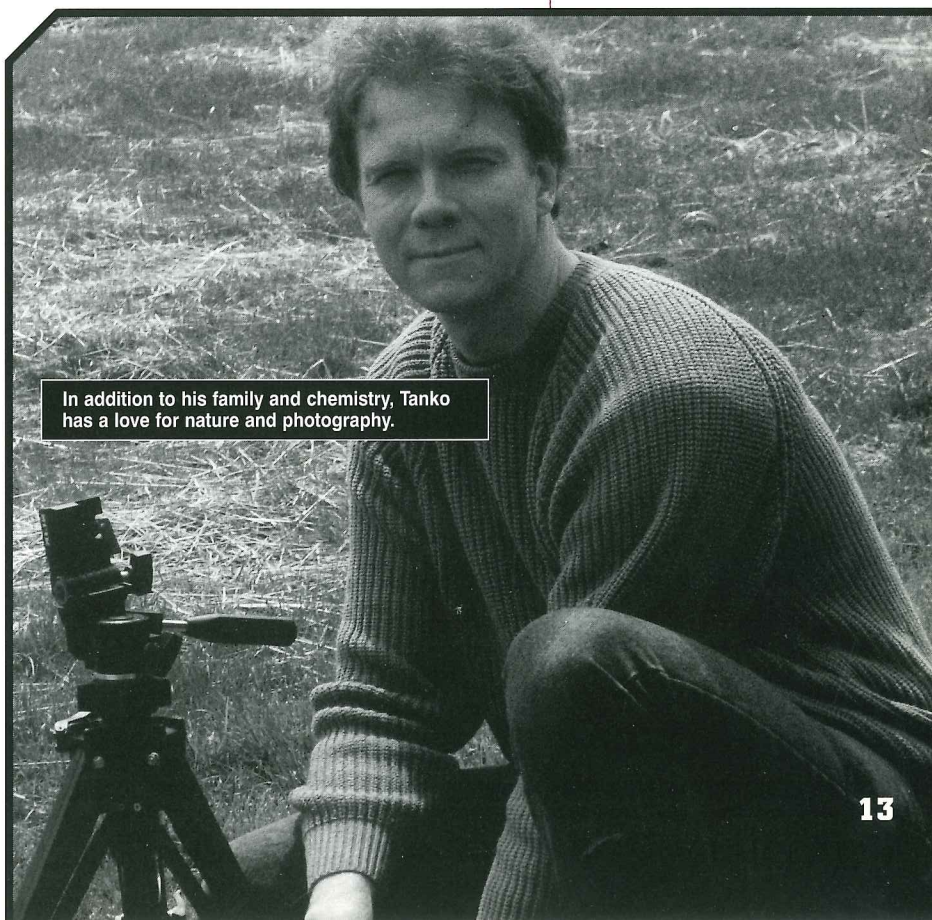
He loves to ride his motorcycle after a long day, and he has developed a knack for photography. He features some of his finest on his web page.

And if there is one thing that James Tanko has learned and applied in his life, it would have to be, stick to the fundamentals and everything will evolve from there.



*"Stick to the
fundamentals and
everything will
evolve from there."*

—Jim Tanko



In addition to his family and chemistry, Tanko has a love for nature and photography.

CLASS NOTES

'29 Robert M. Thomas,

was awarded the Charles Goodyear Medal by the American Chemical Society's Division of Rubber Chemists for his co-invention of butyl rubber, a synthetic that became famous during World War II. He holds 73 patents.

'36 Dr. James M. Smith, Jr.,

(M.S.), holds 22 patents which he has developed with colleagues for methotrexate, a cancer chemotherapeutic agent.

'39 Reese J. Bursey,

Sanford, N.C., worked for DuPont in rayon manufacturing and in military explosives, he retired from the Nuclear Regulation Commission in Washington where he operates a consulting service for nuclear power plants.

'44 Charlie C. Rawlings,

Petersburg, worked 35 years in the pharmaceutical and chemical industry, primarily with Merck & Co. before retiring in 1982. Since then he has had many rewarding part time jobs, but his main interest has been in electric cars. He has converted two gasoline cars to battery powered electric vehicles and drives one daily.

'57 Halley A. Merrell,

won the Shirley B. Radding Award in recognition of his continuing contributions

and support of the American Chemical Society (ACS), which he joined in 1963 as a staff writer. One of the longest serving members of the ACS staff, he also holds the titles of secretary and assistant executive director.

'57 George R. Tichelaar,

(Ph.D.), Carmichael, Calif., died last year. He retired in 1990 from the California Department of Food and Agriculture as chief of chemistry. He was active in Sigma Xi, the American Chemical Society, the Association of Official Analytical Chemists and performed consulting work on Aflatoxin (testing) in the state.

'65 Robert E. Schwerzel,

Alpharetta, Ga., left Georgia Tech Research Institute in June 2000 to join Microcoating Technologies, Inc. as manager of a newly formed photonics business unit.

'67 George B. Vaughan,

San Antonio, Texas, has started his own venture, Healthcheck USA. Individuals can purchase medically accepted lab tests from the company to detect health or disease and base an action program.

'75 William J. Madia,

(Ph.D.), was named director of the

Oak Ridge National Laboratory (ORNL). He has more than 25 years of international experience in research and management and has served as director of the Pacific Northwest Lab and several bettelle corporate laboratories. The ORNL is a large multi-program laboratory of the U.S. Department of Energy.

'77 Jerry M. Clemons,

(Ph.D.), Ronceverte, W.Va., was elected director of the analysis division of the Instrument Society of America. He finished a chapter on "Process Chromatography" for John Wiley's Encyclopedia of Analytical Chemistry.

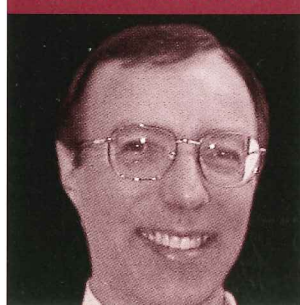
'82 Marvin Franz,

Williamsburg, works as a chemistry shift supervisor at Surry Nuclear Power Station. His son, Ian, was born September, 1998.

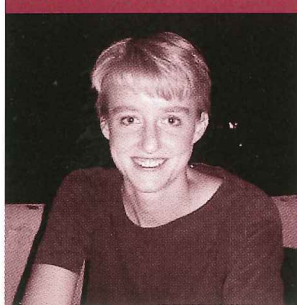
'82 James F. Haw,

(Ph.D.), Los Angeles, Calif. Professor of Chemistry at the University of Southern California (USC), has received the George A. Olah Award in Hydrocarbon or Petroleum Chemistry for his research in heterogeneous catalysis on the surfaces of zeolites and other solid-acid catalysts. He studied with Virginia Tech professor Harry Dorn.

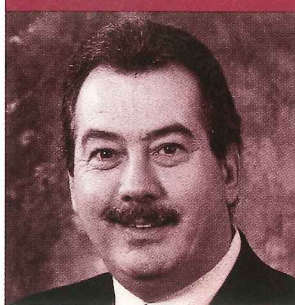
Robert E. Schwerzel



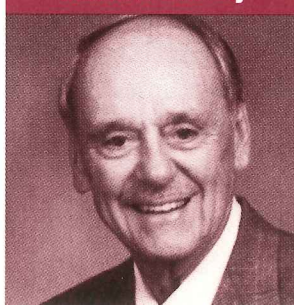
Rachel Krudsen Giunta



William J. Madia



Reese J. Bursey



'90 George A. Reiner,
(Ph.D.), Middletown, N.J., moved from Exxon to International Flowers & Fragrances in 1999.

'92 Steven Stevenson,
(M.S. '92, Ph.D. '95.), is a senior research scientist at Luna Nanomaterials. He worked for professor Harry Dorn as a graduate student and postdoctoral fellow and helped develop derivatives of buckyballs.

'93 Rachel Krudsen Giunta,
works in the Organic Material Department at Sandia National Laboratories in Albuquerque, N.M. and is exploring the Southwest.

'94 Candace M. Coyle,
Windsor, N.J., received her Ph.D. in physical chemistry from West Virginia University in 1999 and now serves as a research associate at Princeton University and is using laser/molecular spectroscopy to study vitamin B12 and heme proteins.

'95 Paul J. Chirik,
Cambridge, Mass., received his Ph.D. in inorganic chemistry from California Technical Institute and accepted a postdoctoral research position at MIT.

'95 Pamela A. Percha
(Ph.D.) has been promoted to research specialist in the corporate analytical technology center of 3M and received the Golden Step Award for her contributions to the Brightness Enhancement Film team.

'96 Carey J. Hancey,
has become a doctoral student in biological chemistry at Penn State University and is writing her thesis project on the catabolic regulation of an essential DNA methyltransferase. She is also engaged to lab mate Vincent Shier.

'97 Michael Lovrencic,
Pittsburg, Pa., received his Masters of Science in Chemistry at University of Pittsburgh ('97-00) and completed MAT program at the University of Pittsburgh ('00-'01), high school teacher certification program.

of the most technologically significant products of the year.

So when he is away from the R&D, what does DeSimone do for R&R? Like any regular Joe, he likes to spend time with his family - wife, Suzanne, and two children, Philip and Emily. "I like playing basketball with my kids and going to the beach," he says. He also is in the enviable position of having a career and hobby rolled into one. "My science is my hobby," he says. "I like to tinker and I enjoy doing that in the field of material science. Chemistry helps me do my hobby and get paid for it!"



"My students

are number one.

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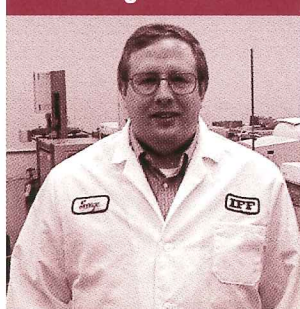
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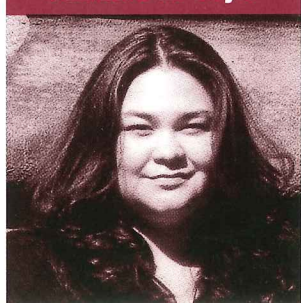
relation to how

they do in science."

George Reiner



Candace M. Coyle



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“we cannot
solve today’s
problems with
yesterday’s
knowledge
base.”

— Einstein

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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.

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