Quanta

A publication for the faculty, staff, students, alumni & friends of the Virginia Tech Physics Department

2006/2007 Volume 7, Issue 1

www.phys.vt.edu

IN THIS ISSUE:

Alumni News… 2

Faculty News… 3

Ladies of Robeson… 5

Zallen Symposium… 6

Staff news… 7

Student Recognitions… 8

Obituaries… 11

Message from the Chair

Once again, you find yourself greeted by a new face! Royce Zia decided to return to full-time teaching and research, and I took over as Chair in August of 2006. Please join me in expressing our deep thanks and appreciation to Royce for his leadership over the past two years. He has worked very hard to bring in new faculty and staff. We are introducing Professors Vicki Soghomonian and Jean Heremans in this edition, and will feature Professors Jonathan Link and Michel Pleimling in the next Quanta. All our staff positions are now filled, and the department is running very smoothly. You will find short bios of our new staff members in this issue and the next.

When I thought about accepting the position as chair, I found myself wondering about the challenges and the opportunities facing the department. Over the past three years, we have hired nine new faculty members, bringing our number to twenty-four. You can imagine that the department is buzzing, with the energy and enthusiasm brought by all of these newcomers. Many of our visitors comment on how friendly, young and energetic the department presents itself these days. I feel excited and honored to be able to work with this wonderful group of people – faculty, staff, and students. I am convinced that our department is headed for a period of major growth – in faculty research activities, student achievements, and staff recognitions. We look forward to interacting with you, our alumni and friends, in many different ways, and hope that you will share your news with us.

In the meantime, I hope you will enjoy reading about the many other achievements of our faculty and students here, as well as those posted on www.phys.vt.edu and www.phys.vt.edu/news/news.html.

With best wishes for 2007,

Beate Schmittmann
Professor and Chair

COLLEGE OF SCIENCE

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Dr. Carter T. White (Class of 1971) receives two prestigious awards

Article courtesy of the Naval Research Laboratory

Dr. Carter T. White, a Senior Scientist with the Naval Research Laboratory's Chemistry Division, has received the Laboratory's highest civilian honor for scientific achievement, the annual E. O. Hulburt Award. Dr. White, a member of the Navy Technology Center for Safety and Survivability, was recognized for his "outstanding contributions to the theory of carbon nanotubes and shock-induced chemistry, which influenced the development of both fields, the activities of numerous scientists in government, academia, and private industry, and the current shaping of agency program goals."

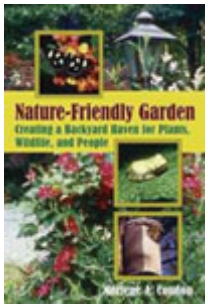
In addition, Dr. White is the recipient of the Chemical Society of Washington's distinguished Hillebrand Prize for 2005. The society recognized Dr. White with the 80th presentation of this annual award in early March. His work appeared in the March issue of the Capital Chemist.

The Hillebrand Prize honors Dr. White "for seminal and sustained contributions to the theory of carbon nanotubes and shock-induced chemistry in materials."

Dr. White was born in Leesburg, Virginia where he graduated from Loudoun County High School in 1967. He received his B.S. and Ph.D. degrees in physics in 1971 and 1976, respectively, from Virginia Tech and the University of Virginia. He also spent a year at the National Science Foundation as Program Director for Condensed Matter/Materials Theory (1985 - 1986) and at the University of Oxford (1996 - 1997) in the UK. Dr. White has published over 170 refereed papers with this work cited over 4,500 times in the refereed literature. Six of these papers have won NRL Alan Berman Research Publication Awards. Some of his other recognitions include the NRL-Edison Sigma Xi Pure Science Award (1996), election to Fellowship of the American Physical Society (APS) through the Division of Chemical Physics (1998), and appointment as Westinghouse Distinguished Professor of Materials Science and Engineering at Washington State University (1999).

Dr. White is the Co-chair of the 2005 APS Topical Conference on Shock Compression of Condensed Matter and has also served as Chair (1998) and Vice-chair (1997) of the APS Shock Compression Science Award Committee. In addition, he is an active member of the American Chemical Society and the Materials Research Society. His professional performance and development record includes over 300 presentations including more than 75 invited talks at professional society meetings, workshops, Gordon conferences, and NATO institutes.

Books published



Marlene A. Condon (Class of 1979) has published *The Nature-Friendly Garden: Creating a Haven for Plants, Wildlife, and People, Too*, which offers up the best techniques to sustain an environmentally balanced garden that keeps wildlife damage and invasive plant growth to a minimum.

To order this book, visit http://www.stackpolebooks.com.

Professor Richard Zallen retires

Dr. Zallen with his wife, daughter, son, daughter-in-law, and grandchildren

On May 5, 2006, the physics department honored Dr. Richard Zallen with a retirement luncheon at the Hillcrest Dining Room. Guests included Dr. Zallen's family, current faculty and staff members, retired faculty members, and friends from other departments across campus.
After lunch, Dr. Zallen's wife and colleagues entertained the audience with anecdotes about his sense of humor, interests, and mannerisms. Speakers included Doris Zallen, Lay Nam Chang, Royce Zia, Marvin Blecher, Beate Schmittmann, Randy Heflin, and Paul Zweifel. At the end, Department Chair Royce Zia presented Dr. Zallen with a metallic globe.

Prof. Marvin Blecher

Dr. Zallen holds a Ph.D. from Harvard University, and has been a member of the Virginia Tech community since 1983. A member of the Virginia Tech community since 1983, Dick taught a wide variety of undergraduate and graduate lecture courses in his specialized areas of expertise—solid state physics and general introductory physics. He published more than 100 articles in professional journals and a book, which has been translated into Chinese and Polish, and his works have been cited more than 5,000 times. He was conferred the title of "professor emeritus" by the Virginia Tech Board of Visitors during its quarterly meeting on March 27, 2006.

-see "Zallen Symposium" pg 6

New faculty members

Jean Heremans

Jean J. Heremans joins us from Ohio University, where he was a faculty member. Prior to that, he was staff scientist at the Emcore Corporation (a semiconductor company in New Jersey), and a post-doctoral research associate at Florida State University and the National High Magnetic Field Laboratory in Tallahassee, Florida. Jean earned his Ph.D. from Princeton University. His research interests are in experimental condensed matter physics, and center on electronic and magnetic properties of nanostructures, such as controllably fabricated semiconductor, metal or molecular systems. Areas of study include spin phenomena in quantum-coherent nanopatterned semiconductor heterostructures, electronic transport in molecular systems, electronic transport in organic semiconductor structures, and magnetic sensor geometries on high-mobility semiconductors.

-see "New Faculty" pg 5

New Faculty

Vicki Soghomonian

Victoria Soghomonian joined Virginia Tech from Ohio University, where she was a faculty member. Preceding that post, she was a post-doctoral research associate at the National High Magnetic Field Laboratory in Tallahassee, Florida. She completed her doctoral studies at Syracuse University. Her current research interests include investigating electronic and physical properties of biomolecules such as DNA, transport characteristics of conjugated acenes for nanoscale organic semiconductor applications, and synthesis and structural characterization of novel materials, with desired functionality, through various chemical methods

Faculty recognitions

Five faculty members chosen as Virginia Tech Scholars of the Week

During the 2005/2006 academic year, five physics professors were recognized as Virginia Tech Scholars of the Week by the Office of the Vice President of Research. They were:

- Leo Piilonen (Feb. 6- Feb. 12, 2006)
- Marvin Blecher (Apr. 10- Apr. 16, 2006)
- John Simonetti (May 8- May 14, 2006)
- Uwe Täuber (July 24-30, 2006)
- Randy Heflin (Dec. 11-17, 2006)

Books published by faculty members

In Search of Another Miraculous Year
by: **Djordje Minic**

Prof. Djordje Minic reflects upon the significance of Einstein's discoveries from the "miraculous year" (1905) on the major currents of physics developed during the 20th century.

No Equations! Relativity Illustrated
by: **Tatsu Takeuchi**

Professor Takeuchi's book explains Einstein's Special Theory of Relativity without using ANY equations.

- **Royce Zia** was elected Fellow of the American Physical Society. See our next Quanta for the full story.
- **Mark Pitt's** research at Jefferson Lab was featured in *The Economist* magazine.
- **Richard Zallen's** exhibit of line drawings and illustrations, "The Aesthetics' of Physics: Patterns from the Physics of Solids", was displayed at the Wallace Hall Gallery from Jan. 17 to Feb. 3, 2006.
- **Roger Chang** was the winner of the 2006 Faculty Appreciation Day Student Choice Award from the Student Alumni Associates of the Virginia Tech Alumni Association.
- **Giti Khodaparast** received an AFOSR Young Investigators Research Program Award.

The Ladies of Robeson: Now In Their Fourth Year and Growing!

Article courtesy of : Devon Triplett, class of '07

If you've been wandering the halls of Robeson lately, you may have heard people talk about the "LORs". This stands for "Ladies of Robeson", which is a group of female students, faculty, and staff within the physics department. Four years ago, several female physics majors established this group in order to support and encourage fellow women in physics. Each incoming class contains only five or six female students, and some of them change majors even before their freshman year is over. Hopefully, if these students have access to advice and friendly faces they could turn to, maybe they will decide to stay in the department. To put this idea in action, the "Ladies of Robeson" were founded by Beth Reid and Alma Robinson in 2002. Pam Granger joined the founders shortly thereafter. In 2004, Annalisa Pawlosky became the student coordinator for the group. Under her guidance, the number of active members increased enormously and meetings became a regular occurrence.

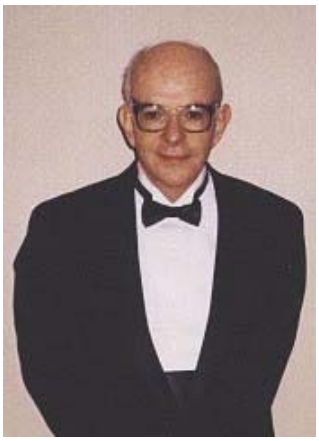
Mostly, the Ladies of Robeson events are social activities where students and faculty can relax together and ask each other for suggestions on issues such as undergraduate research or the graduate school application process. One favorite event is the end-of-semester potluck dinner at Dr. Schmittmann's house. Since the male students and faculty in the department became quite curious about the LOR, we started to invite them to the potluck, so that everyone in the department can share the experience. Over the last couple of years, we added new kinds of events such as hosting our own alumni or female faculty from other physics departments. For example, we had a wonderful informal dinner and conversation with Prof. Laurie McNeil, the Chair of the Physics Department at the University of North Carolina. Her visit was coordinated with AdvanceVT, an NSF funded program at Virginia Tech designed to increase the participation and advancement of women in academic science and engineering careers. In Spring 2006, Annalisa arranged for three of the founding members, Beth, Alma, and Pam, to come and talk to undergraduates about their experiences after graduating. It was really exciting to show them how the group had grown. The event was a huge success because it inspired the undergraduates, and the alumnae had fun visiting with professors and staff at the dinner following the talk. During this time I was preparing to take over from Annalisa once she graduated. Both of us saw the potential in this alumni panel and started to plan an expanded version for the next year.

The physics family (males included) at the end-of-the-year LOR party at Dr. Schmittmann's house on May 2, 2006.

See "LOR" pg 10

Department hosts Zallen Symposium

On Friday, August 18, 2006, the Physics Department hosted the Zallen Symposium in honor of Dr. Richard Zallen, who retired in December 2005 after teaching at Virginia Tech for 22 years.



The Zallen trademark: Dick in his tuxedo.

The symposium was hosted by Prof. Randy Heflin. Guest speakers included: Paul Grant, IBM research staff member emeritus and visiting scholar in applied physics at Stanford University; Scott Massie, COO of Emcore Corporation; Stuart Solin, Hohenberg Professor of physics at Washington University; Michael Thorpe, Foundation Professor of physics, chemistry, and biochemistry at Arizona State University; Bernard Weinstein, professor of physics at SUNY Buffalo; and Dr. Zallen's daughter, Dr. Jennifer Zallen, a researcher at the Sloan-Kettering Institute.

The invited lecturers pose with Dr. Zallen at a pre-symposium reception hosted by Dick Zallen and his wife, Doris.

Invited colleagues were asked to present current research in their respective fields. Each speaker spoke on specific topics ranging from rigidity percolation to technical challenges in the advanced-superconductor industry. The lectures were interlaced with humorous stories of Dr. Zallen's research during his time as a student at Harvard University and of his days working for IBM.

During an afternoon break, the lecturers were invited to join faculty, staff, and students at the annual Back-to-School Barbeque, an annual tradition aimed at introducing new students as well as welcoming back returning students. After lunch, presentations resumed. When the colloquium adjourned later in the afternoon, guests were treated to a reception in the atrium of the Chemistry/Physics building.

Dick and his daughter, Jennifer, listen intently to Paul Grant's lecture titled *"Supercities and Supergrids: Teratechnologies for an Exajoule World"*.

Staff Recognitions

On April 28, 2006, the College of Science held its annual Staff Recognition Luncheon at Owens Banquet Hall. At the luncheon, three staff members from the Department of Physics were honored for their hard work and dedication to the college.

- **Cindy Davis**, program support technician, has been with the department for ten years.
- **Chris Thomas**, graduate student coordinator, has been with the department for thirty years.
- **Melvin Shaver**, machine shop supervisor, had been with the Physics department for forty years. Sadly, he retired in July 2006. Best of luck to Melvin!

Dean Lay Nam Chang presents Melvin Shaver with a key to the Physics department. Melvin retired on July 1, 2006 after forty years of service.

New Staff Members

Josh Peebles is the new lab and demo manager for the department. His duties include setup and maintenance of the introductory labs, setup for all lecture demonstrations, and other responsibilities as needed. Josh is originally from Richmond, VA, but has resided exclusively in Blacksburg since 2002 at the beginning of his 2nd year of college. He graduated from the Virginia Tech Physics Department in May 2006 with a BS in physics and minors in astronomy and math. This is his first "real life" job after working several odd jobs throughout high school and college to pay the bills and rent. Josh enjoys playing and recording music, mostly guitar and bass, tinkering with old keyboards and computer parts, listening to music on vinyl, reading, astronomy, and watching "Star Wars" and "Buffy the Vampire Slayer".

Brian Skinner wins Goldwater Scholarship

Article courtesy of: Catherine Doss, Virginia Tech News, April 17, 2006

About midway through his first year at Virginia Tech, University Honors student Brian Skinner had earned enough credits to be classified as a junior.

And while most freshmen spent their first winter break catching up on much needed R and R, Skinner was busy writing code for a project on the physics of traffic he had embarked on with Beate Schmittmann, a professor of physics in the College of Science at Virginia Tech.

"Brian brims with ideas and is not afraid to throw himself into a project," Schmittmann said. "He is highly motivated, very bright, and truly independent in his thinking."

Skinner's time and talents have paid off in a big way, as he has been awarded a highly competitive Barry M. Goldwater scholarship for the 2006-2007 academic year. He is among 323 Goldwater scholars chosen this year from an applicant field of 1,081 undergraduates nationwide in engineering, science, and mathematics. Goldwater scholars are selected for academic merit and each is awarded up to $7,500 per year for tuition, fees, books, and room and board. Congress established the scholarship program in 1986 to honor the late Sen. Goldwater and to encourage outstanding students to pursue careers in mathematics, the natural sciences, or engineering.

Brian Skinner

Skinner is the son of Kristian and Carolina Skinner of St. Anthony, Idaho. He is double majoring in physics and mechanical engineering and plans to pursue a Ph.D. in theoretical physics and eventually conduct research and teach on the university level.

Skinner has been involved in several physics-related research projects. Last summer, he was a member of the MIT Quantum Computing Group, a small team of graduate and undergraduate students whose work included mathematical modeling, programming, and use of an NMR spectrometer. At Virginia Tech, Skinner has worked with professors Beate Schmittmann and Royce Zia to create and analyze computer models for the dynamics of pedestrian traffic and parasite-host interactions.

"The more I am exposed to different fields of scientific research, the more I am motivated to pursue a research career," Skinner said. "Scientific research is so fascinating because it is a process of perpetual revolution, whereby we recognize the limits of our own understanding and challenge the assumptions we have made about the universe around us."

– see "Skinner" pg 9

Skinner *continued from pg 8*

Skinner has also worked as a research assistant with Bruce Vogelaar, associate professor of physics, in experimental particle physics. As part of Vogelaar's research team, Skinner helped develop diamond-like coatings made with a Class IV excimer laser to transport ultra-cold neutrons. These coatings are a critical part of the team's research that is being conducted at the Los Alamos National Laboratory in New Mexico.

"There is no doubt Brian will prove to be a scientist of note as he progresses in his career," Vogelaar said. "His resume already speaks to his broader understanding of the world at large and its intrinsic challenges and a scientist's social responsibilities."

Skinner has won departmental scholarships in physics as well as scholarships in the College of Science and College of Engineering, a National Merit Scholarship, and a Presidential Campus Enrichment Grant. He is also an active tutor in high school physics and mathematics.

Skinner is Virginia Tech's 33rd Goldwater scholar since the program began in 1986.

Awards and Scholarships

- **Annalisa Pawlosky** received the 2005 Dean's Scholarship from the College of Science.
- **Melissa Harnist** was awarded the Leonard and Melva Harris Scholarship from the College of Science.
- **David Erickson** and **Brian Skinner** received the David and Ruth Henderson Scholarship from the College of Science.
- **Debabrata Mohapatra** received the Sigma Xi Award for Achievement in Research by a Ph.D. student candidate for his work at the Belle Experiment.
- **David Erickson** received the Phi Kappa Phi Medallion award. He was also selected by the Virginia Tech chapter as one of two graduating seniors with the greatest potential for future scholarly contributions. In addition, David was nominated to the national Phi Kappa Phi organization for a Graduate Fellowship.
- **Juliette Mammei** was awarded the SURA/Jefferson Lab Graduate Fellowship for the 2006/2007 academic year.
- **Brian Skinner** was a finalist for a 2007 Rhodes Scholarship.

The Physics Department awarded scholarships to a record number of our undergraduate and graduate students at our annual awards ceremony on April 21, 2006. For more details, go to http://www.phys.vt.edu/~awards/awards2006.html.

LOR *continued from pg 5*

Devon Triplett and Robin Jackson discuss the alumni panel.

With the help of Robin Jackson, Director of Alumni Relations for the College of Science, we held our second alumni panel on November 10th, 2006. Six alumni – four males and two females – came to talk to undergraduates about their options after graduating in physics. The speakers consisted of physics graduate students, high school physics teachers, and an employee of an astronomy software company. Robin and I scheduled the event to coincide with the College of Science Homecoming weekend. This allowed us to acquire football tickets for the alumni and to provide them with dinner at the COS tailgate. The alumni had a great time and the undergraduates were very thankful for the advice. Dr. Schmittmann and Diane Walker-Green are already thinking of alumni who would be good candidates for next year's panel. If you are a physics department graduate and interested in joining the panel or if you have any questions about the Ladies of Robeson, please feel free to e-mail me at ldtripl@vt.edu. Thanks!

The founding of LOR

Article courtesy of : Beth Reid, class of '03

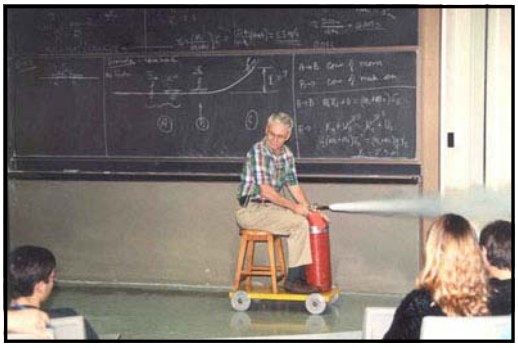
Statistical mechanics teaches us that even in equilibrium, strange things can happen: all the gas molecules in a room can gather in a corner, or female physicists can fill Blacksburg's finest restaurant with the gaiety that comes only from uncertainty principle jokes.

Tired of waiting, in the fall of 2002 we undergraduate women used our social butterfly skills to condense the female occupants of Robeson Hall amid dishes of spinach artichoke dip at the Cellar. Our purpose was simple: to get to know and encourage one another, and to be invited to some of the coolest 'pads' in town. As we had hoped, in the spring Dr. Schmittmann inspired us all by displaying all the perks that apparently come with a successful career as a physicist -- a beautiful house that honors the ancient mathematicians with its circular geometry, felines educated in the standard model, and a knowledge of the heat equation deep enough to perfect the chili. The Ladies of Robeson have sent the first of us off -- some to law school, some to spread the physics love to young minds, and some to physics graduate school -- but we have gone with a smile of confidence and warm memories of our time spent in the Virginia Tech Physics Department. And we leave knowing many more will similarly follow.

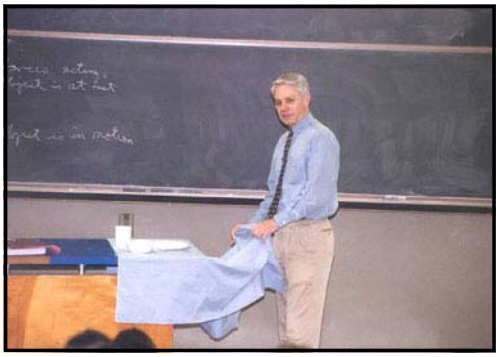
Obituary: *Dr. Dale Long*

It is with great sadness that we report the passing of Dr. Dale Long, who died peacefully at his home in Blacksburg on June 17, 2006. Dr. Long taught in our department for 33 years before retiring in 2000. In 1991, he was honored with the William E. Wine Award for Excellence in Teaching. He was conferred the title of "Professor Emeritus of Physics" upon his retirement. Dr. Long is survived by his wife, two sons, three grandsons, two sisters, and two brothers.

Dr. Long received his undergraduate degree from Virginia Tech, and went on to receive a Ph.D. from Florida State University. In the late 1970s to early 1980s, he collaborated on a conceptual textbook titled *The Physics Around You*. In 1991, his love for physics led him to initiate the Alice Estes Martin Scholarship, named for an inspirational former teacher of Louisa County High School. The scholarship provides incentive and support to a physics major of high academic achievement who is committed to teaching physics in secondary school.



Dale Long proves the principle of conservation of linear momentum



Dr. Long demonstrates Newton's First Law

Dr. Long's family requests that memorials be given to one of the following funds:

The Hearts and Hammers Ministry
c/o Blacksburg Baptist Church
550 North Main Street
Blacksburg, VA 24060

or

The Alice Estes Martin Scholarship

For donation information, go to http://www.givingto.vt.edu/.

Quanta 2006

Editor: Betty J. Wilkins

Additional editing, content, and design: Beate Schmittmann

Contributors: Catherine Doss, Jean Heremans, Naval Research Laboratory, Josh Peebles, Beth Reid, Vicki Soghomonian, Devon Triplett

Making a tax deductible contribution

By contributing to the education of physics, you contribute to the future of all!

The future of our department truly depends on loyal supporters like you who, year after year, provide financial support for quality education and research excellence.

Listed below are a few ways in which interested donors can contribute:

- Through gift planning – charitable gifts that provide an income.
- Through gifts of security – stocks, bonds, or mutual funds.
- Through matching gifts – if your employer has a matching gift program, you can double or even triple your contributions.

To learn more about the different ways you can help, visit the Virginia Tech Office of University Development's "Giving to Virginia Tech" website (http://www.givingto.vt.edu). Alternatively, you can visit our own site (http://www.phys.vt.edu/giving.html), or use the form on the right.

Contributions are tax deductible as provided by law.

Thank you in advance,

Dr. Beate Schmittmann

Please use the form below and mail to: Virginia Tech Department of Physics, Robeson Hall (0435), Blacksburg, VA 24061. If you need more space, please attach additional sheets.

Name: _____.

Mailing Address:

Street: _____.

City: _____ State: ____ ZIP: _____.

Business:

Job Title: _____.

Business Name: _____.

Street: _____.

City: _____ State: ____ ZIP: _____.

Telephone: _____.

Type of Business: _____.

Web Address: _____.

If you are an alumnus/alumna:

Class Year: _____.

Degree(s) awarded: _____.

Gift Amount: _____.

Gift Description: _____.

Designate your gift to: Virginia Tech Physics Department. Thank you.