Quanta

2016/2017 Volume 17, Issue 1

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

Message from the Chair:

After reading these letters for many years, it is a pleasure to finally write one. This past August, after 20 years in the department, I was honored to become department chair. As part of my summer activities, I put together an annual report and planning document for the near future. That really made me aware of the many outstanding aspects of our department and the excellent potential for the future. I look forward to helping facilitate that. I want to sincerely thank my recent predecessors, Patrick Huber and Leo Piilonen, for all their contributions to our department that have led to this success.

The past two years have been a time of significant change all across the university. We have a new president and provost, and closer to our academic home, we have a new dean of the College of Science. Dean Lay Nam Chang ended his time as dean this past summer, after 13 years as the founding dean of the College of Science. We thank him for all his work on behalf of the college over that time and welcome him back to the department. The College of Science Roundtable donated to endow a chair in his name – the Lay Nam Chang Dean's Chair in the College of Science. The first holder of that chair is our new dean – Dean Sally Morton. Dean Morton has visited us several times here in Robeson, and we all look forward to working with her to make the College of Science even stronger. Personally, I have enjoyed working with her very much.

IN THIS ISSUE:

Our department continues to have a record number of students. Just a few years ago, we tripled the number of freshman physics majors, and now we are beginning to see that affect the size of our graduating class. This year, we will graduate a total of about 55 undergraduate majors, which puts us in the top 10 for bachelor's degrees among the 190 Ph.D. granting departments in the U.S.! Speaking of Ph.D.'s, our graduate program continues strong with about 89 students enrolled in Fall 2016. Even with increased numbers, we are proud that we continue to offer outstanding research opportunities to our students. We continue to grow on the faculty and staff side as well, and you can read about our new faculty member (Tommy O'Donnell), new staff members (Lynn Bryant, Heather Nolen), and several new postdoctoral fellows in this newsletter.

Finally, the department received a nice early holiday gift just last week. We were notified that we have been selected as a 2016 University Exemplary Department for the theme of developing and sustaining effective large class instruction! We share this honor with our fellow departments in the College of Science – Biological Sciences and Chemistry. In our case, it is due to the outstanding efforts of many people in our large introductory astronomy class and the calculus and algebra based introductory physics classes. Some of the alumni receiving this newsletter will recall that the department also won this award in 1999 and 2003. This year's award relied on contributions from all parts of our department. The undergraduate students serve as undergraduate learning assistants, the graduate students provide core support as recitation and lab instructors, our full and part time instructor staff are essential to the effort, our shop, computer, and administrative staff provide critical support, and the faculty play a key role. So congratulations to all!

I hope you enjoy this newsletter. Feel free to drop me a line or even better, should you be in Blacksburg come and see me in Robeson Hall. I've been here long enough that I know many of you, and it would be great to catch up.

Happy Holidays!

COLLEGE OF SCIENCE

Virginia Tech

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Mark Pitt named Chair of the Department of Physics

Longtime Virginia Tech College of Science professor Mark Pitt has been named as chair of the Department of Physics.

Pitt's research focuses on nuclear physics with a primary interest in electron scattering and weak interactions. He is considered a leader in using parity-violating electron scattering to study the structure of the proton and search for evidence of "new physics" beyond the currently accepted standard model of particle physics. This work takes place at the Thomas Jefferson National Accelerator Facility in Newport News, Virginia, where he serves as chair of Institutional Council for the Qweak Experiment, and is deputy spokesperson and chair of the executive board for the MOLLER experiment.

"Mark is extremely well thought of by his peers here at Virginia Tech and from across the academic field of physics," said Sally C. Morton, dean of the College of Science. "Physics faculty teach students in science and from across the university, including the College of Engineering and the College of Architecture and Urban Studies. Physics is truly one of the most in-demand, heavily relied-on departments at Virginia Tech. As the university moves forward in its mission of being a world-class research institution with a focus on interdisciplinary education, I am glad Mark is in the lead."

Pitt joined the Virginia Tech faculty in 1997. Among his teaching duties was responsibility for the design and implementation of the calculus-based introductory physics laboratory facility in Hahn Hall North and for co-authoring the lab manuals that teach roughly 2,000 students per semester in the 2305 and 2306 Foundations of Physics course sequence.

Since 1998, his research funding from the National Science Foundation as primary investigator or support investigator totals $5.6 million. He received a Faculty Early Career Development Award from the foundation in 1998. He has co-authored more than 45 papers in peer-reviewed journals.

He takes over the department chair's position from Patrick Huber, also a professor in the department.

Pitt earned a bachelor's of science from California Institute of Technology in 1985, and a master's in 1987 and a doctoral degree in 1992, both from Princeton University; all in physics.

Written by Steven Mackay

VT News August 25, 2016

Sally C. Morton appointed Dean of College of Science

Virginia Tech Executive Vice President and Provost Thanassis Rikakis announces the appointment of Sally C. Morton as dean of the College of Science.

Currently serving as professor and chair in the Department of Biostatistics in the Graduate School of Public Health at the University of Pittsburgh, Morton will begin at Virginia Tech on July 1.

Morton will succeed Lay Nam Chang, who will step down from the position on June 30, having served as founding dean of the College of Science since 2003 and as dean of the former College of Arts and Sciences beginning in 2002. Chang joined Virginia Tech's Department of Physics in 1978.

"I am quite pleased to have Dr. Morton joining our leadership team as the new dean of the College of Science," aid Rikakis. "She has a strong record of research and scholarship and brings great strength in her collaborative, multidisciplinary approach to programs, research, and leadership. Her unique combination of experience and leadership bridging academia and industry will enable the college to continue building innovative programs and leverage existing and emerging strengths in ways that will advance the college and university."

"The Virginia Tech College of Science in its 13 years has had an incredible history of providing students with a hands-on, minds-on university education not found anywhere else, and I look forward to carrying on the work started by Dean Lay Nam Chang," said Morton. "From its beginning as a land-grant university, Virginia Tech has dedicated itself to the community, the state, and the world, and I am proud to join with the college in advancing science and technology to create a better, healthier, sustainable future."

At the University of Pittsburgh, Morton also directs the Comparative Effectiveness Research Center in the Health Policy Institute and holds appointments in the university's Graduate School of Public and International Affairs, Department of Statistics, and the Clinical and Translation Science Institute.

She has more than 30 years experience in academic and research settings, focusing on patient-centered comparative effectiveness and evidence synthesis. Her current collaborative projects address back pain and serious mental illness, and she is a co-investigator on the PaTH Clinical Data Research Network.

Before joining the University of Pittsburgh, Morton served as vice president for statistics and epidemiology at RTI International and was head of the RAND Corporation Statistics Group.

Morton was 2009 president of the American Statistical Association (ASA) and the 2013 chair of Section U (Statistics) of the American Association for the Advancement of Science, and she is a Fellow of both organizations. She also is an elected member of the International Statistical Institute and of the Society for Research Synthesis Methodology.

In 2015, Morton was honored with the ASA's Founder's Award and was the Lowell Reed Invited Lecturer for the American Public Health Association's Applied Public Health Statistics Section. She currently is a member of the Patient-Centered Outcomes Research Institute Methodology Committee, and the Agency for Healthcare Research and Quality Evidence-based Practice Center Program Methods Steering Committee. She also has served on several National Academy of Medicine committees, the Census Scientific Advisory Committee, and the National Academy of Sciences Committee on National Statistics.

Morton holds a bachelor's degree in mathematical sciences, a master's degree in operations research, and a doctoral degree in statistics, all from Stanford University, as well as a master's degree in statistics from the London School of Economics.

Written by Steven Mackay

VT News March 29, 2016

Patrick Huber among first Distinguished Scholars by Fermi National Accelerator Laboratory

Fermi National Accelerator Laboratory has named Patrick Huber, of Virginia Tech's Department of Physics, as one of its four new Fermilab Distinguished Scholars.

The two-year appointment in an inaugural program by the Batavia, Illinois-based laboratory, part of the U.S Department of Energy's Office of Science, will bring Huber and one or two graduate students of his choosing to the lab for research into theoretical physics. Huber said he will visit the lab June 1-15 and then later in the fall for another two weeks. The accompanying students have not not yet been selected.

"I have been a strong advocate for Fermilab's neutrino program since the early 2000s, and thus, it is very natural for me to spend some extended periods at the lab," said Huber of the Virginia Tech College of Science.

"I was delighted to learn that Patrick will be one our inaugural Fermilab Distinguished Scholars," said Joe Lykken, deputy director of Fermilab. "I have known Patrick for many years as one of the world's leading neutrino theorists. He has worked closely with neutrino experimentalists and helped to develop the leading simulation tool for neutrino oscillation experiments. His presence at Fermilab will be a big intellectual boost towards maximizing the exciting physics potential of our present and future efforts towards understanding the mysteries of neutrinos."

According to Lykken, his primary mission with the scholar program is to strengthen connections between Fermilab Theoretical Physics and Astrophysics groups and the wider U.S. particle-theory community. He also wants to increase resident theoretical expertise in targeted physics areas to support the lab's experimental program. "During the term of their appointment, they have the same research opportunities and support infrastructure as Fermilab scientists," stated a lab announcement.

Huber's fellow appointees hail from the University of Illinois at Urbana-Champaign, the University of Washington, and State University of New York at Buffalo.

Huber's invitation came after an outside advisory group, consisting of six prominent theorists representing the U.S. community, recommended him as an outstanding candidate, according to the lab.

Fermilab is funded by the U.S. Department of Energy's Office of Science and operated by the Fermi Research Alliance LLC, a partnership of the University of Chicago and Universities Research Association Inc., a consortium of 89 research universities. Virginia Tech is a member of the association, and Virginia Tech President Tim Sands serves on its Council of Presidents and is expected to serve as vice chair in 2017 and chairman in 2018.

Founded in 1967, Fermilab's mission is to build the world's most advanced particle accelerators, to dig down to the smallest building blocks of matter, study the farthest reaches of the universe, and seek out the nature of dark matter and dark energy.

Written by Steven Mackay

VT News June 3, 2016

Michel Pleimling receives Alumni Award for Excellence in Teaching

Michel Pleimling, professor of physics and director of the Academy of Integrated Science in the College of Science, has received the university's 2016 Alumni Award for Excellence in Teaching.

Created in 1982 by the Virginia Tech Alumni Association, the Alumni Award for Excellence in Teaching is presented to two Virginia Tech faculty members each year. Recipients are selected by the university's Academy of Teaching Excellence from among faculty members who have received Certificates of Teaching Excellence. Each recipient is awarded $2,000 and is inducted into the Academy of Teaching Excellence.

Seeing the difficulty many students were having mastering the introduction of complicated new concepts in conjunction with advanced mathematical techniques in a 3000 level course, Pleimling created PHYS 2504 Math Methods in Physics as an introductory course to these more complicated techniques.

"Over the years Michel has provided many outstanding contributions to the university's teaching mission, as a superb teacher, advocate of modern teaching pedagogies, leader of curriculum reforms, facilitator of innovative new degree programs, and outstanding research adviser," wrote Patrick Huber, professor and chair of the Department of Physics, in a letter of nomination.

Pleimling was also the co-developer of the four-semester Integrated Science Curriculum for the College of Science that teaches students introductory science and math in a novel, integrated way, using modern pedagogies in the SCALE-UP learning environment.

He believes in taking advantage of different learning environments, providing hands-on experience for students, involving students as early as possible in research, and keeping students up-to-date on the most recent progress achieved in their field of study.

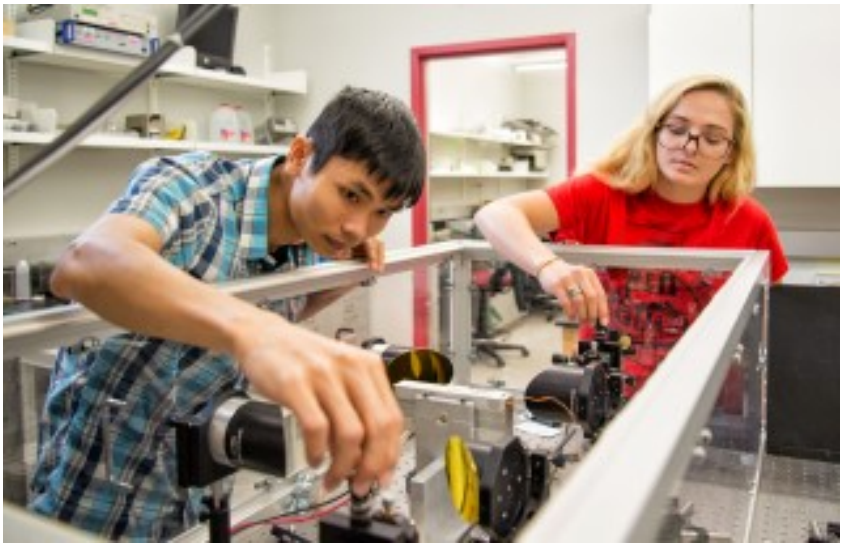
Pleimling's dedication to his student's success is best measured by his well-attended office hours, often causing traffic jams in the hallway, as well as his exceptional student evaluation scores.

Pleimling earned his Ph.D. from the University Saarland in Germany.

Written by Steven Mackay

VT News April 22, 2016

Center for Soft Matter and Biological Physics seeks to connect research across Virginia Tech



The newly formed Virginia Tech Center for Soft Matter and Biological Physics, launched this past winter in the Department of Physics, but has its eye on forming research projects across the university.

Chartered by the Virginia Tech Office of the Vice President for Research and Innovation, the center's mission is to "advance the rapidly growing research areas of soft matter and biological physics." It already has more than 30 faculty members as affiliates from the College of Science's departments of Biological Sciences, Chemistry, and Physics, in addition to the College of Engineering's departments of Biological Systems Engineering, Biomedical Engineering and Mechanics, Computer Science, Chemical Engineering, and Mechanical Engineering.

Additional collaboration will be sought from across the university.

"Truly novel ideas in science often emerge from exchanges across disciplines, and the transfer of fundamental concepts or powerful technology from one field to another," said Uwe Täuber, inaugural center director and professor of physics. "Our new center addresses a strong demand."

From 8 a.m. to 5 p.m. May 19 at 130 Hahn Hall North, the center will host its first annual symposium, with more than 20 faculty and 50 students and post-doctorate researchers presenting research projects that could spur inter-university collaborations.

Topics will range from polymer crystallization and protein nanocomposite structures to bacterial motility and the mechanisms behind circadian clocks, and cover experimental tools including terahertz spectroscopy and nanoassembly. Computer simulations of biomolecular kinetics and theoretical modeling of spatial organization also will be featured.

"One of our main goals is to identify common research interests that may lead to joint projects and/or funding proposals," added Täuber.

The center ties in with the Beyond Boundaries initiative under Virginia Tech President Tim Sands that promises to build a university that teaches students to take head-on complex problems that transcend economic, geographic, social, spatial, and disciplinary boundaries, said Täuber.

Research will focus on the ever-broadening topics of soft matter and biological physics. Soft matter focuses on developing materials relevant to biology, physiology, and a wide range of technological applications, including polymers, liquid crystals, foams, gels used in drug delivery, as well as materials that could make synthetic human tissues and organs. Nanotechnology, part of College of Science's Academy of Integrated Science program, also will be a major component.

Biological physics focuses on how physical tools – both experimental and mathematical – can be used to describe nature's molecular "machines" and the overarching principles governing living systems. In particular, programmable biology – seen as a multi-billion-dollar industry of the future –will be a focus of the center.

"The usefulness of physics reaches quite far," said William Mather, an assistant professor of physics and a member of center's steering committee. "Not only is physics a tool for nanotechnology, but the ideas in physics help to find order in the chaos of biological systems."

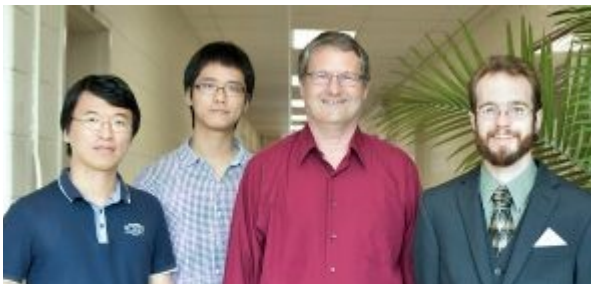
In Vinh Nguyen's physics lab at Hahn Hall North, students are using femtosecond laser – highly detailed, rarely done – to study how proteins relate to deadly diseases. "Problems in protein folding and aggregation are believed to be the cause of many devastating diseases, such as Alzheimer's and Parkinson's," said Nguyen, an assistant professor. "Unfortunately, there are no diagnostics for the early stages of these diseases. We are employing terahertz radiation to explore the conformational dynamics of proteins in solutions, which will shed light on the relation between protein aggregation and these diseases."

The center also will collaborate with new and established outreach programs for STEM – science, technology, engineering, and math – initiatives with K-12 students from Virginia and neighboring states. Additionally, other programs under the Academy of Integrated Science program – such as computational modeling and data analytics, and systems biology – that promote interdisciplinary undergraduate education and novel degrees also will be highlighted.

Written by Steven Mackay

VT News May 18, 2016

Virginia Tech physics research team scores three projects with Hubble Space Telescope



In bowling, three strikes in a row is called a "turkey." Nahum Arav and three members of his Virginia Tech Department of Physics research lab have pulled off a galactic turkey, getting all three of their proposed projects with the Hubble Space Telescope approved for the coming year.

While likely not the first time one research team has pulled off such a feat in the 27-year history of the NASA telescope, Arav said it's rare and certainly a first for Virginia Tech. The chances of getting a project tasked to the famed NASA space-observatory are one in five, said Arav, who has been working on and off with the Earth-orbiting vehicle since it launched in 1989.

When research is slated for Hubble, the project is not physically placed onto the 24,400-pound space-based projectile. Instead, it is assigned time, or orbits of 1.5 hours each, to use the device's nearly 8-foot mirror and extraordinarily high-resolution cameras that can see objects in space – free of atmospheric interference that can warp visibility – and produce images and spectra in infrared, visible, and ultraviolet light.

Arav will continue his career-long study of black holes and quasars, the latter being mysterious bursts of light created when matter falls into a black hole, creating something akin to a last jolt of incredible energy.

The largest of the projects designed by Arav will take 40 orbits around Earth, or roughly 65 hours of the Hubble's time. This effort will focus on extreme ultraviolet radiation coming from 10 quasars to measure the likely impact of quasar outflows on the formation and evolution of galaxies, including our own Milky Way galaxy, which has at its center a massive, dormant black hole known as Sagittarius A*.

"A long time ago, roughly 10 billion years, such a phenomenon helped shape the galaxy we call home," added Arav, noting that not all of the orbit time is usable.

The second project involves nine orbits around the Earth to take what Arav calls the first-ever images of these same quasar outflows and see their extent and relationship to their host galaxy. The third project focuses not on using Hubble itself, but getting funding for analysis of archival observations by the telescope that tie directly to the same group of 10 quasars.

Arav said all archived images and data from Hubble are open source.

The large amounts of gravitational energy released when matter falls into a super-massive black-hole create light 100 times more luminous than the entire galaxy. That luminescence is a quasar.

Arav said that theorists "have shown that if only 5 percent of this energy is released as mechanical energy, it can be a dominant mechanism in shaping the final formation of the galaxy," as well as determining the mass of the super-massive black-hole where the quasar originates.

"Due to the results of our research program, these quasar outflows are the leading candidate for the source of this mechanical energy," he said.

To ensure that researchers are able to best use the Hubble's time and support resources, NASA funds these projects. Arav's team, which includes a current doctoral student and a recent doctoral graduate, all part of the Virginia Tech College of Science, will receive $300,000 from NASA's Space Telescope Science Institute. Funds will help the team analyze the data and imagery for the next two years.

Arav submitted his proposals in March and learned in June that all three of his submissions were accepted. The calendar year for Hubble Space Telescope projects begins in September.

Arav and his team will not observe the Hubble's orbits in real time. Program scientists form the Space Telescope Science Institute handle all observations and data and imagery collection. "Shortly after that we download the data from the institute, and then we have a proprietary period of one year to work on the data exclusively," said Arav. "After that, anyone can download the data and try to analyze it.

"The analysis is very challenging and for that, during the past 10 years, we built state-of-the-art scientific software that allows us to tease the science out of the data," added Arav.

The team is changing this year as the Hubble projects move forward. On Aug. 1, Arav departed for a full-year sabbatical at Technion, the Israel Institute of Technology. Post-doctorate researcher Guilin Liu will soon become a professor at the University of Science and Technology of China. Recent doctoral graduate Carter Chamberlain, of Wrenthan, Massachusetts, will soon become a data scientist for private industry. Remaining in Blacksburg will be Department of Physics doctoral student Xinfeng Xu, of Guangde County, Anhui Province, China.

Xingfeng's work on these projects will form his dissertation. "This is my first time working on the Hubble Space Telescope, and I am so lucky that we got three proposals at one time," he said. "I am now following Dr. Arav and doing the relative research on active galactic nuclei (AGN) outflow. These nuclei have a black hole in its center, so it will be a very high-energy object. Many things about an AGN, like the structure and growth, are not fully understood. So I think it is a good starting point."

Arav said he has been interested in space since he was 6 years old, when he watched news of the late 1960s moon landings by NASA and heard bedtime tall tales of science fiction adventures created by his father. Yet he knew he didn't want to be an astronaut, even in second grade. He wanted others to bring space findings to him, so he could study and try to understand them. The Hubble Telescope is helping him do exactly that.

Written by Steven Mackay

VT News June 3, 2016

R. Bruce Vogelaar named William E. Hassinger Jr. Senior Faculty Fellow

R. Bruce Vogelaar, professor of physics in the College of Science at Virginia Tech, recently received the William E. Hassinger Jr. Senior Faculty Fellowship in Physics from the Virginia Tech Board of Visitors.

The William E. Hassinger Jr. Senior Faculty Fellowship was established in 2007 by its namesake to enhance the national and international prominence of Virginia Tech's Department of Physics. The fellowship supports research programs considered most likely to generate important scientific breakthroughs of a fundamental or applied nature.

The fellowship appointment is for three years and is renewable.

Vogelaar joined the Virginia Tech faculty in 1998 and has made significant contributions to neutrino physics and underground science.

He has led several major initiatives including a bid for Virginia Tech to become host of the Deep Underground and Science Laboratory, which resulted in the creation of the Kimballton Underground Research Facility.

He also led an internationally recognized research program in neutrino physics and weak interactio ns with ultracold neutrons. A highlight is his work during the past two decades on the Borexino solar neutrino experiment at Italy's Gran Sasso laboratory. He is known for his contributions to achieving the unprecedented levels of radiopurity in this detector and implementing the calibration systems critical to achieving the physics results.

In 2013, he was recognized in part for this work when he became a Fellow of the American Physical Society.

Vogelaar has a strong external research grant record, with continuous, multiple-grant funding support from the National Science Foundation since 1998. His total external peer-reviewed funding record includes $9.8 million as principal investigator and $16.8 million as principal investigator or co-principal investigator.

He received his bachelor's degree from Hope College and a master's degree and Ph.D. from California Institute of Technology in 1989.

Written by Steven Mackay

VT News August 23, 2016

Welcome Our New Faculty Members

Thomas O'Donnell- appointed as assistant professor, works on experimental searches for neutrinoless double-beta decay with the CUORE and KamLAND-Zen detectors. This hypothetical, but theoretically well motivated process, is eagerly sought by particle physicists to deepen our understanding of neutrino masses and possibly discover lepton number violation. Related processes are key ingredients in theories that attempt to explain the abundance of matter over antimatter in the Universe. Thomas earned a bachelor's degree in mathematics and physics from National University of Ireland, Cork in 2003 and a doctoral degree in physics from the University of California Berkeley in 2011. Prior to joining Virginia Tech he was a postdoctoral researcher at UC Berkeley.

Welcome our new Research Faculty

Sumanta Pal—Works with Professor Patrick Huber on the CHANDLER reactor monitoring and neutrino experiment.

Vishvas Pandey— Vishvas Pandey joined the department in November 2016, and is working with Prof. Camillo Mariani on Neutrino Physics. He completed his PhD from Ghent University (Belgium) in 2016 where he was working on modeling neutrino interactions on nuclei. Before moving to Belgium in 2010, he finished his masters from Indian Institute of Technology Roorkee where his thesis was about exploring neutrino masses in string theory framework. When not contemplating about neutrinos and not jabbering about the vastness of the universe to his friends in the nearest cafe, Vishvas enjoys chess, biking, badminton, table-tennis and cricket.

Antonio Russo—works with Edwin Barnes and Sofia Economou on condensed matter theory.

Girish Sharma—PostDoc at VIrginia Tech with Sophia Economou and Edwin Barnes, September 2016 onwards. PhD (Theoretical Condensed Matter Physics) from Clemson University, SC, USA from August 2012-August 2016. PhD advisor: Dr. Sumanta Tewari. Joint Masters degree (Physics and Applied Math) from Ecole Polytechnique, France and University of Gothenburg, Sweden 2010-2012.

In short...

Assistant Professor Vinh Nguyen recognized as Teacher of the week January 25-29.

Professor Michel Pleimling recognized with COS Certificate of Teaching Excellence.

Professor Eric Sharpe recognized as Scholar of the week April 11–15.

Associate Professor Giti Khodaparast selected by American Physical Society as the Woman Physicist for the month of March.

Professor Jonathan Link recognized as Scholar of the week June 6-11.

Associate Professor Sophia Economou featured in Nanotechweb technology update for silicon carbide entanglement research.

Professor Nahum Arav recognized by Senator Tim Kaine for recent grants received.

A Well Deserved Congratulations!!

Congratulations to **Nahum Arav** on being promoted to full Professor

Congratulations to **Camillo Mariani** on being promoted to Associate Professor with tenure

Staff News

Welcome Our New Staff Members

Lynn Bryant - joined the department as an Undergraduate Advisor in September this year. Raised in Arkansas, Lynn quickly adapted to the married, Military lifestyle living in California, Washington, Oklahoma, Alaska, and Maryland. Lynn taught at a community college and is where she gained Academic Advising experience. Lynn has a BA in English and a Master's degree in Education from Liberty University and was a certified PreK teacher. She is excited to be working with college students again. Lynn has 2 sons-- 18 and 24 yrs. In her spare time, Lynn likes to listen to music, watch movies, and go antique shopping.

Heather Nolen - Recently graduated from Radford University in December 2015 with two BBAs (Bachelor of Business Administration), one in marketing and one in management.
-While at Radford, I served as the VP for the College of Business and Economics (COBE) Student advisory board. As well as the, Executive office and founding member of the COBE Ambassador program.
-Originally started working at tech in April of 2016 in the College of Veterinary Medicine and moved to the Physics department September 2016.
-Born and raised locally in Blacksburg, until I moved to Floyd County in 07', where I currently live and met my husband.
-Husband and I are expecting a sweet baby boy December 2016.
-plans to apply to Virginia tech in fall of 2017 to continue my education and receive a MBA.

Student News

Applause, Applause!

Undergraduate students **Adam Mills**, **Bevin Huang** and graduate student **Chuanhui Chen** from the Tao group publish a cover article in the Applied Physics Letters.

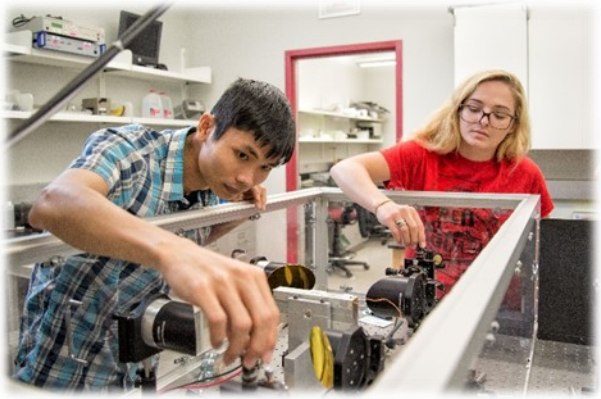
Jackie Berton, first-year Physics student, takes part in NASA's Microgravity Neutral Buoyancy Experiment Design Teams (Micro-g NExT) challenge.

Graduate student **Michael Meeker**, in Professor Khodaparast's group, received the National Academy of Science Fellowship to Join Naval Research Laboratory as a Post Doctoral Associate.

Hiba Assi, won the 2016 Graduate Teaching Assistant Excellence Award.

Department of Physics Annual Fund

Your Support helps Invent the Future



The **Department of Physics** continues to increase the quality and prominence of its research and educational programs. Our nationally and internationally recognized faculty, pursuing research in the areas of particle and nuclear physics, hard and soft condensed matter physics, biophysics and astrophysics while providing our students with a sound education that melds fundamental principles with current research, are helping Virginia Tech improve its standing as one of the top STEM schools in the country.

Your support is critical for our success. Contributions from our alumni and friends help support deserving students, provide state-of-the-art facilities, and expand research activities. Gifts made without restriction allow departmental leaders to respond to opportunities immediately and to allocate resources where they can have the greatest impact.

Every gift counts – no matter the size. Our goal this year is to **increase overall participation.** A gift to the Department of Physics is the clearest signal our alumni and friends can give to show their support of the great work of our faculty and increasing the quality of experience for our students. **When all of us give, our collective contribution makes a significant difference.**

When you receive your College of Science Annual Fund brochure or phone call, please direct your support to the **Department of Physics.** To make an immediate gift, please visit the university's secure, online giving page at givingto.vt.edu or send your check made payable to the Virginia Tech Foundation Inc. to the following address: Virginia Tech, Gift Accounting (0336), University Gateway Center, Blacksburg, VA 24061. Please note Department of Physics in the memo section.

For more information or to learn more about other ways to give, please contact Jenny Orzolek, Director of Development for the College of Science, at 540-231-5643 or jorzolek@vt.edu.

We thank you for your support!

Physics in Your Neighborhood!

Alumni Reunion – 2017 March Meeting of the APS in New Orleans, Louisiana (Time and Place TBD)

For more information, go to http://www.phys.vt.edu/events

Quanta 2016

Editor: Michele Strauss

Additional editing, content, and design: Mark Pitt

Contributors: Heather Nolen, Lynn Bryant, Thomas O'Donnell, Sumanta Pal, Vishvas Pandey, Antonio Russo, Girish Sharma