2018-19 PHYSICS AND ASTRONOMY DEPARTMENT NEWSLETTER

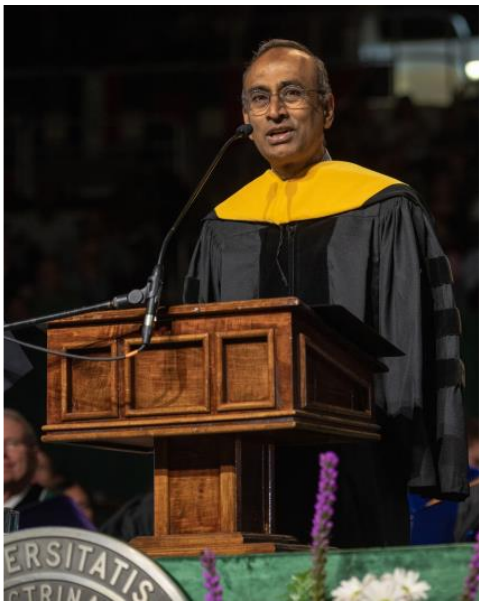
Two Renowned Scientists Receive Honorary Degrees

The Ohio University Graduate Commencement held in May was a special opportunity for us to honor two highly distinguished scientists who were in some way associated in the early years of their lives with the Department of Physics and Astronomy.

"Robert (Bob) Kirshner and Venki Ramakrishnan are outstanding researchers and scientific leaders, and their connection to Ohio University reflects very positively on the institution and its impact on students," said Joe Shields.

David Drabold, a longtime colleague who maintains periodic informal contact with Ramakrishnan, nominated him for the honorary degree. "I felt like I was able to help make something very positive happen," Drabold said. "Seeing Venki here inspiring the whole community, and hopefully reestablishing links to his alma mater made me very glad that he chose to accept our Honorary Degree, one of a very few he has accepted. Venki is also a personal inspiration to me, and in my view, a nearly ideal model of a scientist."

In addition to receiving worldwide recognition in their respective fields, Venkatraman "Venki" Ramakrishnan and Robert Kirshner have in common an association with the Nobel Prize.



Venki Ramakrishnan

Venki Ramakrishnan

Ramakrishnan, a Nobel Prize laureate and OHIO alumnus (Ph.D. Physics, 1976), was 19 years old when he left his home in Baroda, India to join the Ohio University community in 1971. A first-year graduate student in physics, Ramakrishnan had never dreamed that he would one day earn the Nobel Prize in Chemistry for his work on the structure of ribosomes.
"I was being a bit of a rebel; my parents were both biochemists," Ramakrishnan joked, referring to his initial decision to pursue a degree in physics."

Ramakrishnan won the 2009 Nobel Prize in Chemistry for his work on the structure and function of the ribosome, jointly with Thomas A. Steitz and Ada E. Yonath. He also received the Louis-Jeantet Prize for Medicine. He was knighted in Great Britain in 2012 and was elected President of the Royal Society in 2015 for a five-year term. He is a member of the U.S. National Academy of Sciences, Leopoldina and the European Molecular Biology Organization,
and a foreign member of the Indian
National Science Academy.

"A graduate of Ohio University, Venki Ramakrishnan is President of the Royal Society and Group Leader at the Medical Research Council Laboratory of Molecular Biology in Cambridge, UK," OHIO President M. Duane Nellis noted at the Graduate Commencement. "In his research he is particularly noted for his contributions related to understanding the atomic structure of the ribosome—the site within living cells where the genetic information is read to synthesize proteins from amino acids."

Robert Kirshner, President N. Duane Nellis, and Venki Ramakrishnan

During his acceptance speech, Ramakrishnan reflected on his continuing reliance on the foundation the study of physics provided him early in his professional career.

"..At the end of (my Ohio University) graduate study, I discovered two things," Ramakrishnan noted. "I discovered that I was married and had a stepdaughter and a young son. And I discovered that I was probably not cut out to be a physicist. And I went off to launch a second career in biology. But for a while I considered myself a failed physicist. But when I look back on my career, I realize that I had been using my physics training… all along while tackling new and interesting problems in biology. And so, perhaps the one lesson that you can take away from that is, because you give up on one particular career, doesn't actually mean you're a failure. It simply means that you've learned something and you're moving on and trying something new. So, to those of you who are new graduates, we've heard about how jobs are going to change; industries are going to change. So it will require you to be flexible; it will require you to be open to change and you mustn't regard change as failure."

An evening before the commencement ceremony, Ramakrishnan gave a popular public lecture, "The Quest for the Structure of the Biological Machine that Reads Our Genes." See his memoir, The Gene Machine.

Amanda Biederman and Venki Ramakrishnan

OHIO's Nanoscale and Quantum Phenomena Institute editorial intern Amanda Biederman attended the lecture and wrote a reflection on the relevance of his words for students today. Biederman is a Ph.D. candidate in the Department of Biological Sciences. She wrote:

Just as ribosomes consist of the machinery necessary to translate genetic material into the proteins needed for life, Ramakrishnan skillfully translates his complex research into a form that conveys the beauty of cellular biology to a general audience. And like DNA itself, Ramakrishnan's career trajectory has evolved over time, shifting from theoretical equations to experimental determinations of the ribosome structure.

For scientists, a Ph.D. often represents the beginning of an academic career in a highly specialized field. Thus, it can be challenging to step out and appreciate the nature of our studies from a broader perspective. Ramakrishnan recounted that his decision to alter his career path was difficult; most universities were reluctant to take on a student who had already completed his doctoral training in a seemingly disparate field.

One of most striking aspects of Ramakrishnan's story was his persistence. He spoke of the times that he faced rejection and resistance, and he recounted the methods he employed to overcome those challenges throughout his career.

When Ramakrishnan initially struggled to keep up with his peers in the first year of his biology graduate program at the University of California, San Diego, he pushed harder to master the material, even enrolling in undergraduate courses to broaden his understanding of biology. When he later resolved to join a highly competitive field of biological research, he sought creative strategies to compete with his well-funded colleagues.

> *"I had this long, interminable plane trip back (home after a scientific meeting with those colleagues), and I was just thinking of giving up the whole thing altogether," Ramakrishnan said. 'But then I thought, 'This is the most important problem in this field and one of the most important problems in biology: how a gene is read to make proteins.' And so I thought, 'If I don't do this and I watch other people do it, I would just be kicking myself. But if I tried and failed, that's life."*

Ramakrishnan's story highlights the extraordinary value of an interdisciplinary career. As a trained physicist, Ramakrishnan was expected to pursue a career in theoretical computation. Yet his background in physics allowed him to pursue novel techniques as a biologist, ultimately leading him to the discovery that would help to revolutionize the world's understanding of the mechanisms by which proteins are formed. Nearly five decades after he began his journey in Athens, Ohio, the lessons from Ramakrishnan's story remain relevant to young scientists currently pondering their own career paths.

"The opportunity for students to learn from Venki and Bob about their experiences and career trajectories, shaped in part by their time at Ohio University, was meaningful and inspiring," Shields said. "The faculty – now emeritus – who were contemporaries with these honorees also had a lot of fun reminiscing, and sharing in the excitement of seeing students who have gone on to such levels of achievement.

Robert Kirshner

In his acceptance speech and in his introduction during a special Department colloquium, Astrophysicist Robert Kirshner describes how, as a high school junior, he spent the summer in Athens working in our Department as a participant in an NSF-sponsored summer program.

Amanda Biederman and Venki Ramakrishnan

"This experience helped set me on my path as a scientist that helped propel me to Harvard as an undergraduate, on to Caltech or a Ph.D., to Michigan, and then back to Harvard as a faculty member."

Kirshner is the Clowes Research Professor of Science at Harvard University and Chief Program Officer for Science at the Gordon & Betty Moore Foundation, where he leads a team responsible for distributing more than $100 million per year for research and technology to enable
fundamental scientific discoveries.

"In his research (Kirshner) has made groundbreaking contributions in several areas of astronomy, including the physics of exploding stars seen as supernovae, supernova remnants, and the large-scale structure of the universe," President Nellis noted at the Graduate Commencement. "Kirshner has been a leader in the effort to use supernovae to study cosmic expansion, resulting in the discovery that the expansion of the universe is accelerating over time, driven by a mysterious dark energy that has emerged as a new focus of intense inquiry in the scientific community."

Kirshner spoke directly to students and faculty in our Department at a special colloquium the day before Graduate Commencement. "Robert Kirshner gave a wonderful talk on the history of the discovery of the accelerating universe and the current state of the research field," said Doug Clowe.

"Our graduate students enjoyed their interactions with Bob over lunch, where they were able to talk extensively about the current state of science and where he saw astronomical research heading over the coming decades."

In addition to his many research contributions, two of Kirshner's former Ph.D. students have gone on to receive international recognition. Brian Schmidt and Adam Riess shared the 2011 Nobel Prize in Physics with Saul Perlmutter for contributions to the discovery that the expansion of the universe is accelerating. Kirshner was a senior member of one of two teams that demonstrated this phenomenon. He wrote an account of this in his book, The Extravagant Universe: Exploding Stars, Dark Energy, and the Accelerating Cosmos.

Nellis and Djalali congratulate Ramakrishnan

Incidentally, Kirshner was a postdoctoral mentor for Ryan Chornock, and was instrumental in planning the construction of the MDM 2.4 m telescope.

Commencement ceremonies manifest the aspirations of the university in launching students for lifetimes of achievement," Shields said. "The opportunity to recognize and showcase individuals like Bob and Venki provides testimony to our ambitions, and our success in nurturing new generations of thinkers who advance the frontiers of human knowledge."

Pre-commencement photo with Kirshner, Nellis and Ramakrishnan

Editor's Note: *To view a short behind-the-scenes video of Kirshner's and of Ramakrishnan's visits to our Department and interactions with our students, visit our YouTube channel, 'OhioUPhysics'. Using the search feature, type 'Kirshner' or 'Ramakrishnan'.*

Jean Andrews edited this piece and used articles about Kirshner written by Lori Bauer and Ramakrishnan written by Amanda Biederman in OHIO's College of Arts and Sciences Forum.

Greetings to friends and alumni of the Department

I first want to congratulate Marty Kordesch, the editor of this newsletter, for receiving the College of Arts & Sciences Dean's Outstanding Teacher Award. Many of you may remember his music and physics and we look forward each time to his standing wave flame demonstration at the Department's biennial Open House.

Another faculty member recognized by the university is Carl Brune. He has been named a Presidential Research Scholar for his research into nuclear astrophysics and how the elements we are made of are made in stars, supernovae, or neutron star collisions. Much of Carl's research is done with the accelerator in the John E. Edwards Accelerator Laboratory. Carl, Zach Meisel, and others recently got a Major Research Instrumentation (MRI) grant from the National Science Foundation (NSF). This grant will enable us to replace the duoplasmatron source used for 4He and 3He beams with a higher intensity source for the same species.

The Clippinger Laboratories refurbishment project continues. The Chemistry addition is appearing before us in the parking lot on the north side of Clippinger. It is fascinating to watch the construction site activity. They are still on track to move in summer 2020. We have begun the detail planning for refurbishing first the east wing of Clippinger and then the west wing. The target dates are for the east wing to be ready by summer 2022 and the west wing the following summer. Currently, the plans call for the physics labs in the basement to moved up the second floor of west wing, where most of the faculty will also be located. The rest of the faculty and the research labs are to be located on the first floor of the east wing.

I want to thank all the alumni who keep in touch with us through their advisors or through LinkedIn. We love to hear from you and follow your careers. Our current students would appreciate you coming back to Athens to meet with them. They really do want to hear how other students have established their careers. Consider this an open invitation to return and see us.

David Ingram, Chair

November 2018

November 2018

May 2019

May 2019

June 2019

August 2019

Faculty News

Alexander Voinov, Charlotte Elster, Carl Brune, Steve Grimes, and doctoral student **Md Al Mamun** presented papers at the Sixth International Workshop on Compound-Nuclear Reactions and Related Topics CNR18 held in Berkeley, California in September. Voinov's talk was entitled, 'Problem of level densities in compound nuclear reactions'. Elster spoke on 'Faddeev Approach to (d,p) Reactions as Tool to Study Exotic Nuclei'. Brune presented, 'The Transition from Isolated Resonances to the Continuum'. Grimes's talk was entitled, 'Rotational enhancement factor for nuclear level densities'. Al Mamun presented, 'Pairing properties from random distributions of single-particle energy levels'.

The CNR* series was initiated in 2007 with a meeting near Yosemite National Park. It has since moved to Bordeaux (2009), Prague (2011), São Paulo (2013), and Tokyo (2015). The workshop series brings together experts in nuclear theory, experiment, data evaluations, and applications, and fosters interactions between these groups.

David Drabold was an invited speaker at the Ninth International Petra School of Physics (Jordan) on 'Nano Physics: Fundamentals and Applications' in Amman, in October. The titles of his two talks were 'Disorder on the nanoscale: ab initio simulations of amorphous materials' and 'Electrons and phonons at the nanoscale: calculations in disordered materials.' Drabold said such meetings help to create new ideas and approaches to research by combining the insights of diverse researchers. The University of Jordan is a modern and very hospitable venue, steeped on all sides by fascinating history.

David Ingram congratulates **Marty Kordesch** for receiving the 2018 College of Arts & Sciences Dean's Outstanding Teacher Award for his teaching and mentorship of students in our Department.

Quantitative Biology Institute members **Alexander Neiman, Peter Jung**, and their students attended OHIO's Neuroscience Research Day at Lake Hope Lodge in McArthur, Ohio. Neiman presented, 'Dynamics of tree networks of excitable elements: application to sensory neurons.' Neuroscience Research Day brings together members of OHIO's Neuroscience Program, which includes researchers from the departments of Biological Sciences, Biomedical Sciences and our Department.

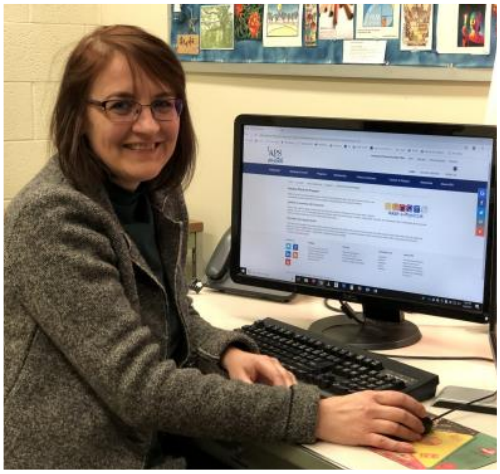
L to R: Tung Le Nguyen, Anika Friedman, Ali Khaledi Nasab, Alexander Neiman, Nilaj Chakrabarty, Peter Jung

Ryan Chornock [*pictured at one of OHIO's Science Café events*] and his student **Reza Katebi's** team received a nod in a November 19 Phys.org report describing their research on the rapid 'turn-on' of a nuclear transient. "...PS1-13cbe is a 'changing-look' AGN that has been powered by instabilities in the accretion disk…the 'turn-on' of this AGN is among the shortest observed in a 'changing look' active galactic nuclei." On January 11, Chornock was quoted in Space.com in an article entitled, Mysterious 'Cow' Blast in Space May Reveal Birth of a Black Hole. Chornock said, "We knew right away that this source went from inactive to peak luminosity within just a few days."

Science magazine wrote about work by a team of scientists led by **Saw-Wai Hla** in an August 26 story headlined "A 2 nm sized nanomachine able to spin and transfer its rotational energy."

In January, ResearchGate awarded **Alexander Govorov** and co-authors "top stats" designation due to the growing number of reads and citations, for articles they have published. In July, Govorov and his former postdoc Lucas Besteiro published results in 'Nano Today' about ultra fast hot electrons. Govorov said "Direct observation of ultra-fast energetic (hot) electrons created by light photons in plasmonic nanodevices has been a nearly impossible task until now."

Each year the Department sends judges and sponsors several awards at the State Science Day held in Columbus. This year, 24 stalwart OHIO representatives organized by **Mark Lucas**, left Athens at 5:45 AM for a full morning of judging 220 projects from students in grades 5 through 12. Our judges hailed from Chemistry, Geology, Plant Biology and two local school teachers in addition to faculty and students from our Department.



Gabriela Popa

During the fall semester, high school classes across the United States 'adopted' several of our Department's physicists and alumni. The goal of the forum is to connect high school physics students to real physics graduates who are eager to share their stories and love of physics. Program guidelines encourage students to ask questions that they find meaningful. For example, questions on hobbies, physics careers, and daily life are welcome. Students and physicists are encouraged to post multiple times weekly and are often surprised at the many things they have in common.

"The high school students are very relaxed and have a genuine interest in physics," said Gabriela Popa, our Associate Professor of Physics at OHIO Zanesville. "They appear to be pulling together lessons from physics class with the news or other information they receive from other media sources."

Along with **Gabriela Popa**, others from our Department included **Julie Roche, Michael Koop, Paul King, Zach Meisel**, as well as alumni **Rakitha Beminiwattha** and **Helen Cothrel.**

Adopt-a-Physicist is a service provided by Sigma Pi Sigma ($\Sigma\Pi\Sigma$), the physics honor society, in collaboration with the American Physical Society, the American Association of Physics Teachers, and ComPADRE. It is supported, in part, by the National Science Foundation and the American Physical Society Campaign for Physics.

Julie Roche, Paul King, Justin Frantz
and graduate students Tyler Danley, Cole Raisbeck, and Kristen Brandenburg traveled to Washington, D.C. in April to visit members of Congress to promote nuclear physics.

SABBATICAL NEWS

Daniel Phillips - from August 2018 until June 2019 my wife, Talinn and I were both on Faculty Fellowship Leave from Ohio University. We–and our two children, Jack (now 8) and Elise (now 4)–spent the year in Darmstadt, Germany. I was a Visiting Professor at the Extreme Matter Institute (EMMI) at GSI). The Theoriezentrum at the Technical University of Darmstadt hosted me and I began collaborations with Hans-Werner Hammer and Achim Schwenk, as well as their students and post-docs. I also organized workshops in Darmstadt and in Trento, Italy and gave seminars at several institutions in Germany, as well as in Sweden, Italy, France, the UK, and Canada.

Talinn (who is a faculty member in Composition & Rhetoric in OHIO's English Department) initiated a research project with the SchreibCenter at TU Darmstadt. Jack attended 3rd Grade at the Christian Morgenstern-Schule in Darmstadt. While this was initially difficult since neither he nor we spoke much German his teachers were very helpful and by the end of the year he was quite fluent in the language. Elise went to the Kinderhaus of the TU Darmstadt which was conveniently located just down the street from the Theoriezentrum. By the end of our time there she was also sufficiently advanced in German that she was correcting mine.

Our home in Darmstadt was at the Georg-Christoph-Lichtenberg-Haus, which had lovely grounds and was situated on the edge of town. However, the transition from an American family home to a two-bedroom apartment did take some adjustment.

The nice location of the Lichtenberg Haus, together with the convenience of German public transport system and the walkability of Darmstadt allowed us to live without a car while we were there, apart from the occasional rental for weekend trips. We took the opportunity to travel quite a bit in Germany and in the rest of Europe. One particular highlight was the Christmas Markets.

We visited several; the picture is from Strasbourg.

We are looking forward to going back to Darmstadt for future trips, since our children and we made a number of friends there. The sabbatical was a very memorable year. We are already looking forward to the next one!

INSTITUTES UPDATES

Institute for Nuclear and Particle Physics

Daniel Phillips has returned from his Faculty Fellowship Leave at Technical University Darmstadt and resumed his role as INPP Director. Thanks to **Carl Brune** for his work as Interim Director. This year several faculty successfully obtained new Federal grants. **Justin Frantz** was awarded a Department of Energy grant to fund his research jet energy loss in heavy-ion collisions. In addition, we received two awards through the "Stewardship Science Academic Alliance" program of the National Nuclear Security Agency, one to fund research on light-ion reactions by **Brune, Tom Massey, and Daniel Phillips,** and another in support of investigations of statistical nuclear physics by **Zach Meisel, Steve Grimes, and Sasha Voinov.** Meanwhile, **Julie Roche and Paul King** continue to receive significant funding from the National Science Foundation and Jefferson Lab to fund their research on nucleon structure. The theorists in INPP are also very active. They are presently hosting three post-doctoral fellows. **Sophia Han**, an expert on nuclear physics and astrophysics of neutron stars, is working with **M Prakash. Robert Baker** is working with **Charlotte Elster** on first-principles calculations of the scattering of nucleons from nuclei, and **Daniel Odell** is working with **Brune and Phillips** on the use of Bayesian methods in analyzing data from light-ion reactions. In addition, post-doc **Manci Saxena** has joined **Meisel's** group and **Bing Xia** is working with **Frantz. Meisel** is also leading the upgrade of the helium-ion source at the accelerator, funded by the National Science Foundation. During the summer 2020, Athens will host two international workshops, both jointly supported by the Joint Institute for Nuclear Astrophysics and INPP: one on R-matrix methods for nuclear reactions and one on Statistical Nuclear Physics for Astrophysics and Applications.

Nanoscale and Quantum Phenomena Institute

NQPI members have been extremely productive over this past year with multiple invited talks, over 60 publications, and several newly awarded grants. The Institute has been active as well with the release of our latest newsletter, strengthening our connections with our alumni, providing funds to over a dozen students for travel, supporting our NQPI Student Fellows, and continuing to provide critical support for research activities.

NQPI welcomes **Joni Staggs** as our new administrative specialist. As an alumna with two children attending OHIO, Joni is a true Bobcat and we are very happy to have her experience and enthusiasm. NQPI also welcomes faculty members **Sarah Hormozi**, **Jessica White**, and **Travis White** who have recently joined the Institute.

Their research in areas ranging from non-Newtonian fluid mechanics to photochemical and photocatalytic processes will certainly enhance and enrich NQPI's existing interdisciplinary research efforts.

A central goal of NQPI is to nurture our connections with our alumni, one of our most valuable resources for helping and guiding our current students beyond their time at OHIO. In addition to NQPI's 'Bring OUr Alumni Back' program, we were fortunate to have **Greg Petersen** (Ph.D. 2013) return to lead a workshop on software design in an industrial setting. Events like these provide our students with invaluable insight and connections to 'real world' applications and we hope to continue to host similar events in the future.

To view our latest NQPI newsletter online, visit us at ohio.edu/cas/nqpi/news/nqpi-newsletters.

Astrophysics Institute

This past year, the Astrophysical Institute had three graduate students obtain their Ph.D.s. **Zhejie "Jerry" Ding** has taken a postdoctoral position at Shanghai Jiao Tong University, **Kornpob Bhirombhakdi** has taken a postdoctoral position at the Space Telescope Science Institute, and **Reza Katebi** has become a machine-learning engineer at Honeywell. The 10" Fecker telescope continues to draw large crowds during open telescope nights, with more than 1,500 visitors over the past year. On the research side, **Ryan Chornock** was heavily involved in observations of the space cow (you will have to Google that one), while **Hee-Jong Seo** has been busy preparing for the start of the DESI survey next year. **Douglas Clowe** has been busy observing at telescopes in Chile on a project to prepare for the LSST survey in 2023.

Quantitative Biology Institute (QBI)

The academic year 2018-2019 saw significant changes for QBI. The previous director of the Institute, **William Holmes** (Biological Sciences), went into well-deserved retirement and **Peter Jung** (Physics & Astronomy) was elected as QBI's new chair. Jung works closely with the new leadership team of neuroscientist **Mitchell Day** (Biological Sciences) and biomathematician **Winfried "Vinny" Just** (Mathematics).

Most notable, the Institute has welcomed five new members during the year expanding the range of research conducted in QBI in new and exciting areas.

Qiliang Wu (Mathematics) brings expertise in the areas of pattern formation, dynamical systems and mathematical biology. **Francois-Xavier Brajot** (College of Health Sciences and Professions) and **Fuh-Cherng Jeng** (School of Communication Sciences and Disorders) conduct research in speech and hearing disorders and on how the brain processes speech and auditory signals. These two new members together with Day and **Alexander Neiman** (Physics & Astronomy) form an interdisciplinary team with a focus on how acoustic signals are processed in the cochlea and brain, and how the brain interprets and produces the motor commands for speech.

Horacio Castillo (Physics & Astronomy) conducts exciting research in the important area of cell reprogramming. **Diego Alvarado-Serrano** (Biological Sciences) brings a new research program to Ohio University and QBI that focuses on the role of spatial and geographical complexity for population genetics. New to our campus, Alvarado-Serrano is an experimentalist, currently establishing a Genomics lab at OHIO as well as a mathematical and computational modeler. We are very excited about his arrival and participation at QBI.

We look forward to another successful year at QBI. Our main goal remains to bring together scientists from the life sciences and physical sciences to form interdisciplinary teams to tackle new and exciting problems and to support their work.

ALUMNI

Pre-2000

Derek Beck (HTC Physics 1999) is now a lieutenant colonel in the US Air Force Reserve. He is presently on long term active duty status at the US Army War College in Pennsylvania. Marty Kordesch visited with Derek in Carlisle, PA, recently.

Robert Borger (Physics 1968) After receiving his bachelor's degree in physics in 1968, Bob served in the air force and completed a Master's degree in geology at Purdue. He had a very successful career in the oil and gas industry, working for many years with Mobil and later as an international consultant with expertise in remote sensing and geophysics. Bob has a wife and son and lives in Corinth, Texas, where he builds and flies airplanes in his retirement.

Henry Clark (Ph.D. 1993, Hicks) Facility Supervisor/Accelerator Physicist and **Cody Parker** (Ph.D. 2016, Brune) Postdoctoral Research Associate, both work at the Cyclotron Institute, Texas A&M University College Station, TX. They met up for a hallway 'Bobcat Photo' for our newsletter.

Clark writes: I am in my 26th year at the Cyclotron Institute at Texas A&M University. The Radiation Effects Facility that I manage recently passed the 50,000 hour mark – that is, we've provided over 50K of beam time hours to companies and agencies in need of space radiation testing (NASA, Space X, Blue Origin, Lockheed Martin, Boeing…). The project has been in operation for nearly 23 years and we have become the world's leader in this area. The income from beam time sales has allowed us to make continued advances in accelerator technology and nuclear physics research when government funding has been limited.

My wife Shannon and I have been co-head coaches and have operated the business of the Aggie Swim Club for the past 19 years. We utilize the Texas A&M natatorium for swim practices and we host many swim meets each year. We started the Club for our own two children (Tyler and Haley) when they showed promise in competitive swimming and the Club grew from there. Membership has remained at about 350 swimmers annually for the past 10 years. We have produced many national level swimmers, state champions, state record holders and many have gone on to swim in college. Both Tyler and Haley went on to college swimming where Haley swam four years at Ohio University. Our son Tyler has served in the US Navy for over four years and his tour is currently in the Middle East. Our daughter Haley, graduated from Ohio University in 2016, then received a Master's from Ohio State University in 2018 and is now in her second year of Veterinarian Medicine School at NC State.

Patrick J. Griffin (B.S. 1974 and Ph.D. 1979, Koshel) was recently named a Laboratory Fellow at Sandia National Laboratories. Patrick has expanded the state of the art in radiation effects to become an acknowledged leader in the international radiation effects community. Pat developed the NuGET code, a major tool for nuclear weapon qualification, and contributed greatly to the development of the radiation qualification process. He grew up in Mineral Ridge, Ohio, a small town near Cleveland, achieving his bachelor's in physics and mathematics and doctorate in nuclear physics at Ohio University. In his new role as a Sandia Fellow, he envisions working with NNSA and the Defense Threat Reduction Agency to better understand the vulnerability of the nuclear stockpile to evolving threats. He hopes to inspire young Sandia staff members to improve the description of the primary damage from neutron displacement and to provide a higher-fidelity model for neutron damage in semiconductors. Another goal is to engage Sandia's statisticians with the radiation damage community and start an internal initiative to apply a rigorous statistical approach to the understanding and quantification of radiation damage.

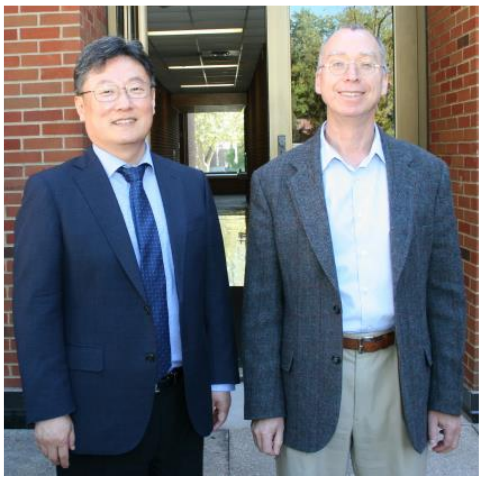
Honors Tutorial College alumnus **Rick Moyer** (Physics, 1979) who received the 2018 John Dawson Award for Excellence in Plasma Physics Research from the American Physical Society. Moyer is a research scientist in the Center for Energy Research and a senior lecturer of mechanical and aerospace engineering at the University of California, San Diego.

The citation reads: "For the first experi-mental demonstration of the stabilization of edge localized modes in high-confinement diverted discharges by application of very small edge-resonant magnetic perturbations, leading to the adoption of suppression coils in the ITER design."

Full description: https://bit.ly/2Wb2wWD

Eric Montei (Ph.D. 1996, Kordesch) and **Gregg Johnson** (Ph.D. 1995, Hunt) visited Ohio University and their old haunts in Athens in summer 2019. Gregg is Associate Professor of Electrical Engineering and Chair, Department of Natural Sciences, Engineering and Technology, at Point Park University in Pittsburgh, PA. Eric attended a conference in Pittsburgh, and the two OHIO Physics alumni decided to visit Athens.

Chuck Niederriter (Ph.D. 1985, Capelletti) Debbie and Chuck Niederriter had a quiet fall and spring as Debbie recovered from last summer's stem cell transplant. The good news is that her multiple myeloma is in check for now but she continues to receive chemo twice a month. It hasn't stopped her from working with special needs children at North Elementary School in Saint Peter. Chuck is still teaching physics and doing research with students at Gustavus Adolphus College. His research interests have diversified to include high altitude ballooning and drones while he continues to work on surface science, condensed matter, and renewable energy projects. Three of their five children have been bitten by the physics bug. This summer, Debbie and Chuck were fortunate to be able to go to visit their youngest, Gretchen, who was doing a research internship at the University of Twente in Enchede, Netherlands. They also had the opportunity to visit friends from their OU days in Germany and Switzerland as well play tourists for about two weeks.



Brent Park and Ken Hicks

Brent Park visited campus in September and presented a colloquium talk. He works for the federal government in the US Department of Energy, as the Deputy Administrator for Defense Nuclear Nonproliferation. Park advises people in the national defense, homeland security and intelligence communities. He reports directly to the Undersecretary for Nuclear Security, and is most probably the highest-placed government official of all PhD alumni from the Department of Physics and Astronomy.

During his visit, Dr. Park met with Interim Dean of the College of Arts and Sciences, Joe Shields, where he also did an interview for Ohio's Alumni Magazine. He also met with graduate students and faculty in the Department of Physics and Astronomy, providing valuable advice on topics ranging from how to successfully transition from a postdoc to a permanent job, and how to enhance our department's research profile by partnering with national labs. He also took a tour of the Edwards Accelerator Lab, which he said was like a "stroll down Memory Lane".
Dr. Park's colloquium talk focused on the national lab system, which provides critical research infrastructure to our national defense. After the colloquium talk, Dr. Park answered questions that related to his early career and about nuclear nonproliferation in his current position. From a survey after the colloquium, some graduate students appreciated the opportunity to hear of non-academic careers that are available to PhD graduates of our department.

Punit Parmananda (Ph.D. 1993, Rollins)
My present coordinates are: Prof. Punit Parmananda, Institute Chair Professor, Department of Physics, Indian Institute of Technology Bombay, Powai, 400076, Mumbai, Maharashtra. Also I attach are recent photo (this summer) of my son, Vinayak, and I at the St Paul's cathedral.

Roger White (Ph.D. 1977, Lane) dined and reminisced with **Steve Grimes,** Frank Dietrich, and Marshall Blann at a pub in Berkeley, CA in September. Roger is recently retired from Lawrence Livermore Laboratory. All are retired and connections to Livermore. Frank came to Edwards Accelerator lab a couple of times to make measurements.

Grimes spent about twelve years at Livermore before coming to OHIO, while the others were at Livermore for about 30 years. Steve was attending the CNR18 nuclear physics meeting in Berkeley that week.

Jerry D. Wilson (Ph.D. 1970, Yun) is an Emeritus Professor of Physics at Lander University who reports he is working on two book editions, An Introduction to Physical Science, 15th edition (Cengage), and College Physics Essentials, 8th edition (Taylor & Francis). About a 15th edition of An Introduction to Physics Science, Jerry says, "It will come out as an ebook, which we have prepared. Then the publisher wanted a hard copy too and we are working on it. I have two coauthors, an astronomer from Middle Tennessee State, and a physicist from Ferris State in Michigan. There have been several since Jim Shipman, Jerry Adams, and I put out the 1st edition in 1971."

ALUMNI

2000-2010

Bassem Sabra (Ph.D. 2000, Shields) I am still at Notre Dame University - Louaize in Lebanon. I was promoted in September of last year (2018) to full professor. I recently completed a 10-week continuing education on space systems engineering. I will be taking part in building the Lebanese space program through cubesat technology. I have two kids: Judy (7) and Mohamad (5). Both want to be astronauts but Moh is afraid of rockets! My wife, Rania, is a physics professor at the Lebanese University. Sometimes it feels like a physics department at home, especially during finals. Poor kids.

Chieh Jen (Jerry) Yang (Ph.D. 2010, Phillips) writes: "I am currently doing postdoc in Chalmers University, Sweden."

2011-2020

Keith Hawkins (HTC Astrophysics, B.S. 2013) returned to campus in October to receive the Charles J. and Claire O. Ping Recent Graduate Award at the OHIO Alumni Association's 78th annual Alumni Awards Gala. He also gave an invited astrophysics seminar talk. Keith serves as a member of the Honors Tutorial College's Diversity and Inclusion Committee. He earned a Ph.D. from the University of Cambridge and was a Simons Junior Postdoctoral Research Fellow at Columbia University.

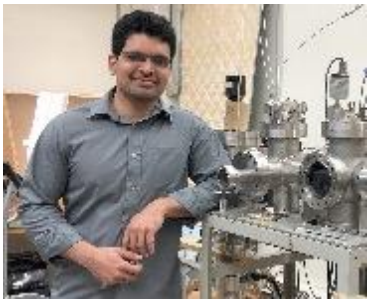
Keith is now an assistant professor of astronomy at the University of Texas at Austin, where he focuses on galactic & stellar archaeology, chemical composition of stars, stellar spectroscopy, and galactic structure.

Yashashree Jadhav (HTC Astrophysics, B.S., 2014) moved to Seoul, South Korea where she is starting a new position as a Researcher at Seoul National University. Jadhav received a Ph.D. from Rochester Institute of Technology in May 2019.

Mahvand Khamesian (Ph.D. 2018, Neiman) is now a Physics Lecturer at Loyola University Chicago.

Larousse Khosravi Khorashad (Ph.D. 2017, Govorov) After a Ph.D. in 2017, I went to start my professional career in San Diego in theoretical and computational physics in the University of California, San Diego in Prof. Liu's Group. After one

year, I came back to Ohio University to work in Prof. Govorov's group as postdoctoral researcher. Meanwhile, I received the NQPI Dissertation Award based on the quality and breadth of my work.



Pratheesh Jakkala (Ph.D. 2017, Kordesch) returned to campus to conduct summer research in Marty Kordesch's lab. Jakkala was an Assistant Professor of Physics at Illinois College in Jacksonville, Illinois. This coming year Jakkala will return to the state of Ohio where he has accepted a position as an Assistant Professor of Physics at the University of Cincinnati.

Sean Krupa (Ph.D. 2016, Stinaff) I have a few small tidbits to report. First, my fiancée Leann and I will be getting married this October 12. Secondly, I've just accepted a position at Penn State University's Electro-Optics Center, part of their Applied Research Laboratory, as a Research and Development Engineer. I start with Penn State in November.

Sean McGraw (Ph.D. 2016, Shields) Upon finishing the Ph.D. program at OHIO in 2016, I spent 8 months as a postdoctoral research fellow at Penn State University where I studied appearance and disappearance events in absorption lines using data from a large spectroscopic survey. I then relocated to join my wife, Andra, in beautiful Switzerland, and have been working as a risk modeling & analytics specialist for UBS bank since January 2018. At UBS I am tasked with validating models related to monitoring & surveillance, financial crime, and more recently artificial intelligence. (Sean is married to **Andrada-Oana Mandru** (Ph.D. 2016, Smith) and the couple dropped by to see Joe Shields in his office during the summer when they visited campus.)

Editor's Note: *The Department's YouTube video of Sean McGraw sharing tips to prepare for a successful Three-Minute Thesis 3MT® presentation has received more than 48,000 views. Visit us on YouTube at 'OhioUPhysics' and search 'Winning Tips' to watch Sean.*

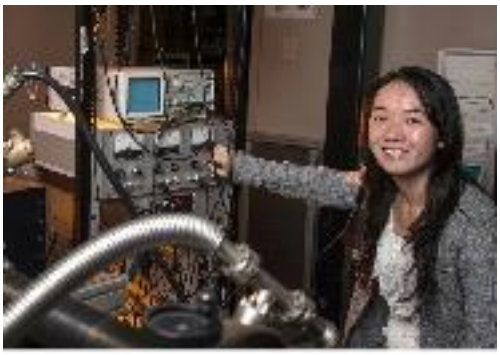
Video production intern Ray Frost snaps a group photo at the Modern Software Design for Physicists workshop

Anup Pandey (Ph.D. 2017, Drabold) is a postdoctoral researcher at Los Alamos National Laboratory.

Greg Petersen (Ph.D. 2013, Sandler) Petersen returned to campus this past summer to lead a 3-day workshop for physics and engineering students and faculty (pictured) that focused on software systems design and architecture. Greg lives in Minneapolis, MN where he is Lead Engineer for Data Analytics and Predictive Modeling at TSI, Inc. where he specializes in machine learning, mathematical modeling, data analysis, physics-based simulations, system building, and software development.

Brett Ragozzine (Ph.D. 2013, Clowe)
I visited OHIO earlier this year to speak to students about transitioning from academia to the field of data science. I have had a great career in data science for the past 6 years. It was very nice to visit and spend time with faculty and students alike--talking about my career in data science and what others can do if they are thinking about doing the same. My work this last year has been contracting with two companies. I have built models of the top-producing product lines for ZAGG (a mobile accessory company). I am finishing that contract this summer. My attention now is working in the role of Chief Data Science Officer for Wrench.ai (provides lead enrichment and insights), which has recently become my full-time job. My family in 2013 (after graduation) - Wife (Angie) and 3 boys (Skyler 7, Wesley 6, Brigham 1)

Andrea Richard (Ph.D. 2018, Crawford) Andrea Richard graduated in May 2018 and started working at the National Superconducting Cyclotron Laboratory at Michigan State University. She is currently a Nuclear Science and Security Consortium (NSSC) postdoctoral fellow working on constraining neutron-capture cross sections for basic research, astrophysics, and applications using beta-decay total absorption spectroscopy. Andrea works closely with collaborators from the University of Oslo in Norway where she spent some time this summer (see photo for group of collaborators at the Akershus Castle!)



Yuan Zhang (Ph.D. 2014, Hla) is an Assistant Professor of Physics at Old Dominion University, Norfolk, Virginia

NEW DEPARTMENT YOUTUBE VIDEOS

Visit our Department's YouTube channel and use the search feature to find:

Dr. Burt Stumpf Turns 90! (1:15 minutes)
Nobel Laureate Rai Weiss Visits
Ohio University (1:14 minutes)
2018 NQPI Student Research Poster Competition (2:40 minutes)
OHIO Physics Undergraduate Summer Research: Jack Bruno (3:33 minutes)
Physics-Neuroscience Major Sheds Light on Neurofilament Activity (2:22 minutes)
Ryan Tumbleson Used an STM to Study the Tiniest of Machines (3:00 minutes)
Reasons to Join Ohio University's Society of Physics Students (2:26 minutes)
Visit behind the scenes with Astronomer Dr. Robert Kirshner (4:37 minutes)
Visit behind the scenes with Nobel Laureate Dr. Venkatraman 'Venki' Ramakrishnan (3:50 minutes)
Modern Software Design for Physicists with Dr. Greg Petersen (3:16 minutes)

RECENT GRADUATES

Undergraduate Degrees

John Auker, College of Arts and Sciences, Physics B.A.

Presently: Obtaining an education Master's degree

Ian Billig, Honors Tutorial College, Physics B.S.

Presently: Working before graduate school

Jack Bruno, Honors Tutorial College, Physics B.S., Math Minor, African American Studies Minor, Magna cum laude

Presently: Harvard University Ph.D. program in Atmospheric Sciences

Ana Bucki-Lopez, College of Arts & Sciences, Astrophysics B.S., Math Minor

Presently: Working at Mt. Lemmon Sky Center, AZ

Rush Deeter, College of Arts and Sciences, Physics B.S., Math Minor

Presently: Ohio University MBA program

Anika Friedman, Honors Tutorial College, Engineering Physics B.S., Neuroscience B.S., Math Minor, Cum laude

Presently: Gap year for research with Peter Jung before graduate school

Esther Grossman, Honors Tutorial College, Engineering Physics B.S.; Chemistry Minor; Math Minor, Summa cum laude

Presently: graduate school in Electrical Engineering at the University of California, San Diego

Daniel Ivory, College of Arts and Sciences, Astrophysics B.S.; Computer Science Minor; Math Minor, Magna cum laude

Presently: Workforce before graduate school

Rhett Miller, College of Arts and Sciences, *Physics B.S.; Math Minor*

Presently: Working for Batelle

Brandon Niese, Honors Tutorial College, Engineering Physics B.S.; Computer Science Minor; Math Minor, Magna cum laude

Presently: University of Texas at Austin Ph.D. program

Jacob Rose, College of Arts and Sciences, Physics B.S.

Presently: Workforce

Alexandra Semposki, College of Arts and Sciences, Physics B.S.; Math Minor, Magna cum laude

Presently: OHIO Physics and Astronomy Master's and Ph.D. in Physics

Ryan Tumbleson, Honors Tutorial College, Engineering Physics B.S., Summa cum laude

Presently: University of California at Santa Cruz, Ph.D. in Physics program

Conner Warnock, College of Arts and Sciences, Physics B.S.; Math Minor

Presently: OHIO Master's degree in Avionics

Master's Degrees

Ibrahim Alnamlah
Kirtan Dixit
Tareq Mahmud
Sineth Premarathna
Robert Radloff
Cole Raisbeck
Joey Rowley
Ahmad Shamloumehr
Sneha Upadhyay

Ph.D. Degrees

Md Abdullah Al Mamun, Ph.D.

Advisor: M. Prakash

Dissertation: 'Nuclei, Nucleons & Quarks for Astrophysical Phenomena'

"My dissertation is concerned with atomic nuclei, their internal constituents nucleons (protons, neutrons, etc.), and quarks of which the nucleons are made of in the astrophysical settings of nucleosynthesis (origin of elements), core-collapse supernovae, neutron stars and their mergers (Gravitational waves). All four fundamental forces (strong nuclear force, weak nuclear force, electromagnetic force, gravitational) play crucial role in these extreme astrophysical environments and hence by studying the inner mechanisms of these stars in turn I tried to shed light in the underlying strong nuclear force itself to better understand how it manifests at various energy and length scales."

Present position: Technology Development Engineer, Intel, Portland, OR

Oscar Avalos Ovando, Ph.D., 2018

Advisor: Sergio E. Ulloa

Dissertation: 'Magnetic Interactions in Transition Metal Dichalcogenides'

"We have theoretically studied magnetic
interactions between magnetic atoms embedded in two dimensional semiconductors materials, such as transition metal dichalcogenides. We also collaborate in transport calculations with Majorana bound states and spin current setups."

Present Position: Postdoctoral Researcher, Ohio University

Bishal Bhattarai, Ph.D., 2018

Advisor: David Drabold

Dissertation: 'Ab initio Structure Inversion for Amorphous Materials'

"My primary research was focused on simulation and modeling of different amorphous systems. This work actively involved density functional theory (DFT) calculations and realistic inversion method using a novel method Force Enhanced Atomic Refinement (FEAR). I have extensively explored large systems with 600-800 atoms using the FEAR method to get a better understanding of different amorphous systems."

Present Position: Postdoctoral Researcher, Washington University, St. Louis

Kornpob Bhirombhakdi, Ph.D., 2019
Advisor: Ryan Chornock

Dissertation: 'Light Curve Powering Mechanisms of Superluminous Supernovae'

"My primary research was on multi-wavelength observational studies on the power sources of superluminous supernovae."

Present Position: Postdoctoral Researcher, Space Telescope Science Institute, Baltimore, MD

Hao Chang, Ph.D., 2018
Advisor: Saw-Wai Hla

Dissertation: 'Synchrotron X-ray STM Investigation of Interfacial Properties of Nanoscale Materials'

"My research entailed developing low temperature Synchrotron X-ray STM, as well as investigating interfacial magnetism of transition metal oxides, interfacial metal to insulator transition in pure metal clusters, and interfacial structure of thin films by an X-ray standing wave."

Present Position: Postdoctoral Researcher, MIT, Cambridge, MA

Taya Nath Chetry, Ph.D., 2019
Advisor: Kenneth Hicks

Dissertation: 'A Study of the Reaction $\gamma d \rightarrow d \rightarrow \pi\pi + \pi - d$ (From Vector Mesons to Possible Dibaryons)'

"My primary research included investigating the interaction between Vector Mesons (V) and nucleons (N). The research outcomes not only yielded the first world measurements for σVN (the total scattering cross section between V and N), but also will help in the comparison of the results from Lattice QCD calculations, when available. I also spent some time investigating possible dibaryon resonances with three charged states namely, d*++, d*0 and d*+ using the same detection sample as the study of the vector mesons. We were able to extract a preliminary differential cross section for the doubly-charged state."

Present position: Mississippi State University/Jefferson National Laboratory

Tyler Danley, Ph.D., 2018
Advisor: Justin Frantz

Dissertation: 'Photon-Related Elliptic Azimuthal Asymmetry and Photon-Hadron Correlations with an Isolation Cut in Au+Au Collisions at √(s_NN_)= 200 GeV at RHIC-PHENIX'

"We developed a method of obtaining direct photons that uses an isolation cut. We have derived single and two particle second order event plane correlation functions including the isolation cut. These equations are used to extract v2 of isolated photons and π0's in Au+Au collisions at √(s_NN) = 200 GeV at RHIC-PHENIX."

Present Position: Seeking a position in Data Science in the San Antonio or Austin, Texas area

Zhejie "Jerry" Ding, Ph.D., 2019
Advisor: Hee-Jong Seo

Dissertation: 'Systematics study and detection of Baryon Acoustic Oscillations from future galaxy survey and weak lensing survey'

"First, I studied theoretical systematics for detecting Baryon Acoustic Oscillations (BAO) from future galaxy surveys. Secondly, I studied the feasibility of detecting BAO directly in matter field from kinematic weak lensing surveys using spectroscopy."

Present position: Postdoctoral Researcher, Shanghai Jiao Tong University

Rekam Giri, Ph.D., 2019
Advisor: Carl Brune

Dissertation: 'Cross Section Measurements of the 12C(alpha, gamma)16O at E_c.m. = 3.7, 4.0, and 4.2 MeV'

"My primary research was on nuclear astrophysics. We were trying to answer astrophysical questions with the help of an experiment performed at the laboratory."

Present position: Postdoctoral Researcher, Department of Chemistry, Indiana University

Ali Khaledi Nasab, Ph.D., 2019
Advisor: Alexander Neiman

Dissertation: 'Collective Dynamics of Excitable Tree Networks'

"I studied the collective dynamics of excitable elements coupled in tree networks. These networks are relevant to sensory neurons, such as touch and pain receptors. I aimed at understanding the mechanism that leads to the emergence of periodic firing in these networks."

Present Position: Postdoctoral Researcher, Department of Neurosurgery, Stanford University, CA

Sudhanva Lalit, Ph.D. 2019
Advisor: M. Prakash

Dissertation: 'The Role of the Equation of State in Core-Collapse Supernovae, Neutron Stars and their mergers'

"My primary research, while a student here, was on equations of state (EoS) for Core-Collapse Supernovae, Neutron Stars and Binary Neutron Star mergers. I worked in extending the Lattimer-Swesty EoS to include multiple light nuclei. I studied phase transitions possible in hybrid stars. I also studied the thermal effects in dense matter and extended them to include next-to-leading order terms of Landau's Fermi Liquid theory."

Present Position: Pursuing a postdoctoral position

Kyaw Zin Latt, Ph.D. 2019
Advisor: Saw-Wai Hla

Dissertation: 'Manipulation of Molecular Charge Density Waves and Molecular Transport System'

"My research was about charge density waves on a self-assembled molecular salt system and manipulating them using STM. I also used manipulation of molecular nanomachines and nanocars using the STM tip induced electric field."

Present Position: Postdoctoral Researcher, University of Chicago, IL

Yingqiao Ma, Ph.D., 2018
Advisor: Arthur Smith

Dissertation: 'A two-dimensional semiconducting GaN-based ferromagnetic monolayer'

"My research has focused on developing novel low-dimensional spintronic materials and heterostructures. I used STM and SP-STM to investigate their complex correlated structural, electronic, and spin properties at the surface."

Present Position: Employee, autopilot and electrical vehicle company, Beijing, China

Tung Nguyen, Ph.D., 2019
Advisor: Peter Jung

Dissertation: 'Computational modeling of slow neurofilament transport along axons'

"I did research on slow axonal transport. We focused on modeling to describe stop-and-go motion of neurofilament transport."

Present position: Family business,
Hanoi, Vietnam

Rajib Pandit, Ph.D., 2019
Advisor: Horacio Castillo

Dissertation: 'Local Fluctuations in the Relaxation Rate in Glassy Systems'

"My research concentrates on the dynamics of structural glasses. In glassy dynamics, particles in some regions move fast while particles in other regions move slowly in a cooperative manner. I have shown that the dynamic can be decomposed into a single-particle contribution and a collective contribution. I have also determined the exchange time of the fast and slow regions."

Present Position: Data Scientist,
Apple Inc., Cupertino, California

Abinash Pun, Ph.D., 2019
Advisor: Justin Frantz

Dissertation: 'Measurements of Di-Jet π0 – h± Correlations in Light-Heavy Ion Collisions at RHIC-PHENIX'

"My research included the study of Quark-Gluon Plasma (QGP) signature (possible) in Light-Heavy ion collision and development and study of sPHENIX electromagnetic calorimeter."

Present position: Post-doctoral Research Associate, NMSU (FermiLab), Chicago, IL

Thushan Wickramasinghe, Ph.D., 2019
Advisor: Eric Stinaff

Dissertation: 'Growth Techniques and Optical and Electrical Characterization of Quantum Confined Zero-Dimensional and Two-Dimensional Device Structures'

"My primary research was studying and perfecting the controlled growth of transition metal dichalcogenide based two dimensional devices with naturally formed contacts for optoelectronic purposes. I found a specific growth mechanism in which the growths became far more deterministic and allowed for the semiconducting material to be contacted with a metal-oxide interface."

Present Position: Lecturer, California Polytechnic State University, San Luis Obispo

Dawei Zhai, Ph.D., 2018
Advisor: Nancy Sandler

Dissertation: 'Studies on electron dynamics in deformed graphene'

"We studied electronic and transport properties of deformed graphene. The goal was to see if we could use graphene deformations for electronic applications, including valley filtering, confinement and wave-guiding, enhanced Kondo effect, and so on."

Present Position: Postdoctoral Researcher, University of Hong Kong

AWARDS

Undergraduate Awards

Society of Physics Undergraduate Research Conference (SPS) participants L to R: Anika Friedman, Ian Billig, Brandon Niese, Jack Bruno, Matthew Connell, Kate Nichols, Ryan Tumbleson

Judges David Tees and Ryan Chornock with Honorable Mention awardees Ryan Tumbleson and Anika Friedman

Tees and Chornock congratulate First Place winner Jack Bruno

Miranda Carver receives the 2018-19 Outstanding Undergraduate Teaching Assistant award from Sergio Ulloa.

2019 Student Expo winners Anika Friedman and Jack Bruno

Undergraduate Awards - 2017

Jack Bruno - Society of Physics Students Research Conference Best Presentation

Anika Friedman - Society of Physics Students Research Conference Honorable Mention

Ryan Tumbleson - Society of Physics Students

Research Conference Honorable Mention

Miranda Carver – Outstanding Undergraduate Teaching Assistant

Jack Bruno – EXPO Research and
Creative Activity Fair 1st Place Winner

Anika Friedman – EXPO Research and Creative Activity Fair
2nd Place Winner

Special Recognition

Sophia Medvid – became the 2019 Field Commander for the
Ohio University
Marching 110. She is the first female band member selected for this honor in the history of the Marching 110.

Phi Beta Kappa

Grant Merz
Graham Tupper

Undergraduate Scholarships

Distinguished Professor (full tuition)

All shown at left

Will Eshbaugh
Kevin Boyd
Tom McGraw
Brittney Kenady

John E. Edwards Fellowship Endowment

Andrew duLuard
Quinn Kissell
Harshil Kothari
Grant Merz
Katelynn Nichols
Claire Schrantz
Jason Tischler
Graham Tupper
Joseph Witkowski

Robert P. Gecsy Physics Scholarship

Lyric Jones

The Darrell Otto Huwe Scholarship

Matthew Connell

The James T. Shipman Physics Scholarship Fund
Caleb Carr
Emma Rice
Hannah Wynne

Abhishek Singh Scholarship

Sophia Medvid

C. Paul and Beth K. Stocker Scholarship

Anthony D'Alessandro
Miranda Carver
Matthew Connell

STUDENT NEWS

SUMMER INTERNSHIPS

2019 Summer Research Interns

Ian Billig (with Daniel Phillips)
'Bayesian analysis of model errors – year 2'

Miranda Carver (with Ken Hicks)
'Study of the f2 (1270) meson using the CLAS detector'

Ryan Conaway (with Zach Meisel) 'Probing systematics in nuclear level density extractions via particle evaporation'

Matthew Connell (Germany DAAD Rise Fellowship) 'Studying the Kinematic Distribution of di-Higgs Signal Models in the bbVV Final State'

Evan Conner (with Julie Roche) 'Preparations of the NPS detector at JLab'

Andrew duLuard (with Ryan Chornock) 'Examining orbital energy transfer in Globular Clusters'

Will Eshbaugh (with Eric Stinaff) 'Graphene exfoliation for novel transport experiments'

Joe Fradette (with Doug Clowe and George Eberts) 'Enhancing the Ohio University Observatory's public outreach capacity'

Ryan Frontz (with Justin Frantz) 'sPHENIX calorimeter simulation studies and construction'

Harshil Kothari (with Hee-Jong Seo) 'Deriving dark energy parameters from galaxy surveys'

Brittney Kenady (with Carl Brune) 'Accurate determination of the thicknesses of thin films of Carbon-12 and Carbon-13'

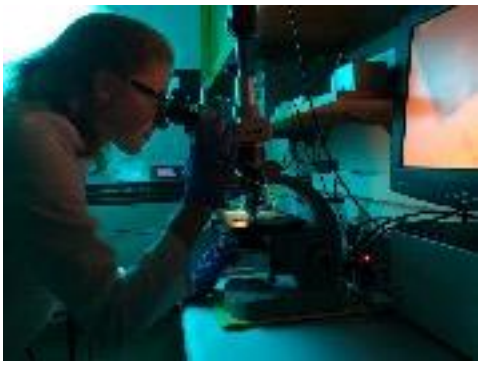
Sierra Knavel (Mathematics) (with Martin Kordesch) 'Barium de-wetting on W (112)'

Tom McGraw (with Art Smith) 'Development of Pulsed Laser Deposition/ Scanning Tunneling Microscopy facility' (with intern Jason Tischler)

Grant Merz (with Zach Meisel) 'Identifying how "coolers" in the outer layers of neutron stars are made'

Katelynn Nichols (with Martin Kordesch) 'In situ Raman spectroscopy of thermionic cathodes at operating temperature'

Emma Rice (with Eric Stinaff) 'Design and implementation of custom laboratory equipment'



Michael Riehl (with Justin Frantz) 'Looking for evidence of Quark-Gluon Plasma (QGP) using the RI observable in Run 13 Proton-Proton Collisions at 510 GeV using RHIC and (s)PHENIX'

Jason Tischler (with Art Smith) 'Development of Pulsed Laser Deposition/ Scanning Tunneling Microscopy facility' (with intern Tom McGraw)

Graham Tupper (with Charlotte Elster) 'Effect of Nonlocality in nuclear potentials on nuclear observables and scattering wave functions'

Michael Vallee (with Paul King) 'Analysis development for the PREX experiment'

Kevin Ward (with Ken Hicks) 'Study of proton-antiproton photoproduction using the CLAS detector'

Joseph Witkowski (with Doug Clowe) 'Calibrating ground based lensing shears with HST imaging'

Robert Zink (with Zach Meisel)
'Mimicking ultrafast flames on the neutron star surface'

GRAD AWARDS

Graduate Awards 2019

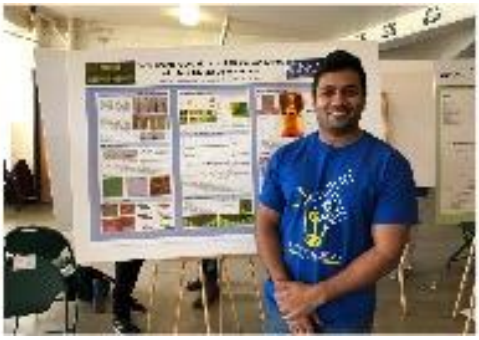
- Yenuel Jones-Alberty – EXPO Research and Creative Activity Fair 1st Place Winner
- Thushan Wickramasinghe – EXPO Research and Creative Activity Fair 2nd Place Winner
- Peter Williams - Department's OutstandingTeaching Assistant Award

Reza Katebi presented his class project results on classifying galaxy images at the invitation of an AI group at the Advanced Technology Development Center in Atlanta, Georgia. Katebi described how he and fellow computer science course classmate Yadi Zhou used a new algorithm called Capsule Network (CN) and compared their results to those using the traditional model, called Convolutional Neural Network (CNN).They found that capsule networks provide more accurate classification than CNNs and reconstructed the galaxy images. Katebi says his class assignment and results provide more understanding about where deep learning algorithms can be used in astronomy to reconstruct poor and low-resolution images with more confidence since they preserve the properties of the original object in the image. An added bonus, he points out, is that the project became a multi-disciplinary collaboration between astronomers, a chemistry graduate student specializing in bioinformatics, and a computer scientist, where each learned about the other's research, which brought an added dimension to problem-solving.

"These results contribute to a better understanding of morphological types of galaxies which is a key parameter for studying their formation and evolution." [Read more online in the College of Arts and Sciences Forum article, "Katebi's Class Project Leads to More Accurate Way to Classify Galaxy Images."]

Joey Rowley was selected from a poster competition to give a talk at the 2019 National Nuclear Physics Summer School (NNPSS), held this year in Knoxville, TN. The NNPSS is a two-week series of lectures for graduate students from across the country in the field of nuclear physics. About 50 students were selected out of more than 100 applicants. All students attending the summer school were required to present a poster of their current research, and the posters were judged competitively. Rowley was one of five students selected from the poster competition to give an oral presentation.

Rowley is doing his doctoral research with Kenneth Hicks on the topic of the elastic scattering of a Lambda-baryon from the proton. The Lambda baryon is made from three quarks, one each of the up, down, and strange quarks. Rowley's research helps to answer the question of whether baryons having strange quarks can exist as stable particles at the center of a neutron star.



Ali Khaledi Nasab received an American Physical Society (APS) Division of Biological Physics 2019 Student Travel Award. His grant helped to defray costs to attend the annual APS meeting in Boston this past March where he presented a paper, 'Dynamics of excitable tree networks: Application to sensory neurons'. He is pictured here with 2018 Nobel Laureate Donna Strickland.

Taya Chetry for receiving recognition at the 2018 JLab Users Group Meeting Poster Competition at Jefferson Lab. As the 3rd Place winner, Taya received a cash award of $100 and a $500 travel fund to use to attend a conference of his choosing.

Kristyn Brandenburg received the 'Outstanding Poster' award for her poster and presentation at the spring 2018 Stewardship Science Academic Programs Symposium in Bethesda, Maryland. The National Nuclear Security Administration sponsored the event.

STAFF AWARDS

Outstanding Staff Member

Stephen Goss

Administrative Service to Ohio University

Alexander Voinov - 15 years
Todd Koren - 20 years
Tom Massey - 30 years


Todd Koren


Tom Massey


Alexander Voinov

Faculty Service to Ohio University

15 years – Alexander Neiman
20 years – Art Smith, Mark Lucas
30 years – Ken Hicks

2018 NQPI Student Poster Competition

Seven graduate students from our Department received top honors at the 2018 Nanoscale and Quantum Phenomena Institute Poster Competition.

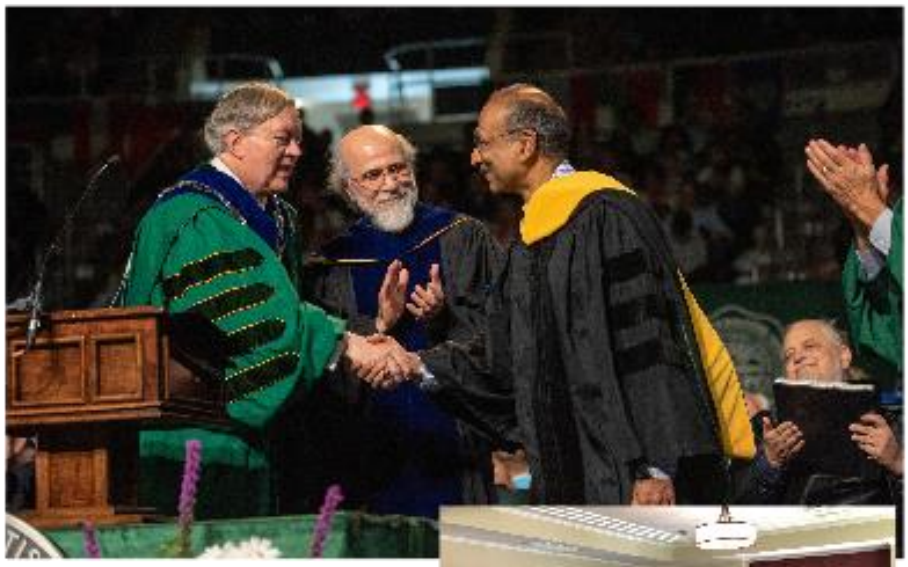
Divided into six groups, the winners for First Place include Thushan Wickramasinghe (Group 1), Sneha Upadhyay (Group 3), Dawei Zhai (Group 4), and Sineth Premarathna (Group 6). Second Place winners include Oscar Avalos Ovando (Group 3) Nilaj Chakrabarty (Group 4), and Md Tareq Mahmud (Group 6).

Highlights from 2019 Commencement Weekend with Robert Kirshner

"Bob is one of the world's leading astronomers who contributed to the extraordinary cosmological revelation that the expansion of the universe is accelerating under the influence of a dark energy that makes space itself expand„. — *Ryan Chornock*

Highlights from 2019 Commencement Weekend with Venki Ramakrishnan

"Venki's schedule was packed during both days, as he gave public and professional lectures, and met with small groups of students and faculty members. Knowing him personally for more than a decade, I was not surprised to see him pause to have a conversation with everyone who approached him. Possibly his favorite part of the visit was meeting Honors Tutorial College students, and individually discussing their plans and aspirations„. — *David Drabold*



Student Outreach

Physics undergraduates Anna Bucki-Lopez (third from right) and Daniel Ivory (fourth from right) were part the STEAM Team during the 2018-19 school year. American Electric Power provided funding to hire ten undergraduates to develop and deliver STEAM (Science, Technology, Engineering, Arts and Mathematics) outreach opportunities for area kids. The group was supervised by Jennifer Hines (Chemistry), Mark Lucas (Physics, fifth from left) and Jennifer Parsons (Executive Director of the Ohio Valley Museum of Discovery). Pictured here is part of the group at the Jerseyville Festival in nearby Shade, Ohio.

Physics students Ahmed Shamloumehr, Emma Rice, Laura Herzog, and Brittney Kenady staff the 'Infrared Camera' and other physics demonstrations at the Spring 2019 Nelsonville-York Science Night.

Undergraduate Claire Shuey helps kids explore the electrostatic wands at the Spring 2019 Coolville Elementary Science Night.

Anna Bucki-Lopez staffs her "What Does a Scientist Look Like" activity at the Coolville Science Night.

Daniel Ivory helps kids learn about electrical circuits at Inclusive Science Day.

The Department of Physics and Astronomy partners with the Ohio Valley Museum of Discovery and WOUB to offer Discovery Lab in the basement of Clippinger weekly during the summer. Here mentors from the Department and community join with the kids in Destruction Night, with everyone tearing into things to see how they work.

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Nobel Laureate Rai Weiss Visits

Professor Rainer "Rai" Weiss of MIT visited our Department on Oct 18, to share his knowledge and enthusiasm for the pursuit of science. He met with many groups, including our nuclear astrophysics graduate students, undergraduate students, and OHIO Trustees. He presented a well-attended public lecture about exploring the universe with gravitational waves.

Weiss along with Kip Thorne and Barry Barish, all a part of the LIGO Scientific Collaboration, were awarded the 2017 Nobel Prize in Physics " for decisive contributions to the LIGO detector and the observation of gravitational waves."



MESSAGE FROM THE EDITOR

Thank you to all who have submitted items for the Newsletter, and to those of you who have kept in touch with faculty, students and friends of the Department. I especially thank science writer and photographer
Jean Andrews, our Department's Special Projects Assistant, for editing the cover article, providing many photos, and helping me to edit this newsletter. We invite you to send us updates and news items on professional and personal developments throughout the year. Photos are always welcome. Visit us on Facebook, Twitter, Instagram, and view the stories we share on our YouTube channel (**OhioUPhysics**).

Send your news to Newsletter Editor **Marty Kordesch** at kordesch@ohio.edu.

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2017-18 OHIO UNIVERSITY PHYSICS AND ASTRONOMY DEPARTMENT