RESONANCES


Your Nose Knows!
Nuclear Physics
Solid State Physics
Bledamsvej

Dr. James Stephen Brooks

July 18, 1944 – September 27, 2014

Dear Friends of the FSU Physics Department,

In late September, we were putting the finishing touches on this year's issue of *Resonances*. On Saturday, September 27—two days after the presumed-finished proof was forwarded to faculty members for final approval—everyone in the department was shocked and saddened by news of the sudden death of our department chair, Dr. James Brooks.

Dr. Brooks had been department chair for about a year, and had written the introduction to this issue, which was the first produced during his time leading FSU Physics. After some discussion and with much respect, we decided to present the issue itself unchanged, but with the addition of the wrap-around cover with this special photographic montage of Dr. Brooks, which you now hold in your hands. While all the members of the department feel the loss of our friend, colleague and chair, we decided to present this issue of *Resonances* in its original form as a reminder and challenge to look to the future with great curiosity and optimism, echoing the theme Dr. Brooks himself employed in his introduction.

A memorial website where you can upload reminiscences and testimonials has been established for Jim Brooks at: http://bit.ly/1x2cpm1

A MagLab press release containing a small fraction of the many responses from Brooks' friends may be found at http://fla.st/1obR5dZ

—*Resonances* staff

RESONANCES
NEWS OF INTEREST TO FLORIDA STATE UNIVERSITY PHYSICS ALUMNI
2014

A Message from the Chair ...

Wow–What a year!

James Brooks
FSU PHYSICS DEPARTMENT CHAIR

Figure 1 **— The Chair of Physics in its natural habitat. Occupant was not occupying the Chair at the time this photo was made, but said occupant did conceive this photo.**

I have been in this chair (see figure 1) for a year, but it seems like only yesterday. I guess the main message is that even with the enormous inconvenience of the building renovation with the department's staff, faculty and students spread out all over campus for nine months, we still managed to gain ground and excel in many ways. Our undergraduate students continue to become more active and involved in such areas as undergraduate research, poster presentations, diversity programs and an increased participation in the senior thesis program. Likewise, our graduate population continues to grow and to diversify in its constitution and in its interdisciplinary research connections. New faculty hired last fall are quickly gaining traction in their new roles in academia, and new hires for this coming year are either here or in the final stages of offer negotiations. Much of this is recognized, as evidenced by the many awards given for staff, faculty and students this year, featured within these pages.

I know from unsolicited comments from "above" that we are considered one of the largest and most successful departments on campus[1]. But these are not easy times; the role of universities and their programs face both financial constraints and challenges to their function and even in some cases their existence. Hence, hard work, imagination and diligence are needed not only to survive, but moreover, to grow in activity, prestige, and adaptability to respond in a timely manner to the needs of a changing society. As Chair, one of my major challenges is to hold onto the productive faculty we already have.

Our Department is meeting these challenges in many ways already. One thrust is the relatively new Astrophysics program that now boast six faculty and staff members, a growing group of undergraduate and graduate majors, and a curriculum that includes completely new courses that teach such topics as magnetohydrodynamics and experimental (hands-on!) astrophysics in our new AstroLab on the sixth floor. The traditional three "pillars" of the Department, Nuclear, High Energy/Particle and Condensed Matter Physics are now, with Astrophysics, four. This brings yet another dimension to our program, since there are strong scientific overlaps between Nuclear, High Energy and Astrophysics, and our faculty and students can now work comfortably in interdisciplinary programs that involve these three areas. Adding in stellar dust formatio n, perhaps even Condensed Matter and the MagLab might join this team in the future!

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Mark Riley wins Lawton Award, FSU's top faculty honor

Mark A. Riley, a world-renowned nuclear physicist in the Florida State University College of Arts and Sciences, has been named the 2014-2015 Robert O. Lawton Distinguished Professor, the highest honor the university faculty bestows on one of its own.

Riley was recognized during the university's spring commencement ceremony on Friday, May 2, at the Donald L. Tucker Civic Center.

"Dr. Riley's research into nuclear-structure physics and the techniques of gamma-ray spectroscopy have given him international stature and make him an excellent choice for this high honor," said Interim President Garnett S. Stokes.

"Mark Riley's spectacular career makes him eminently worthy of joining our university's top layer as a Lawton Professor," said Sam Huckaba, dean of the college. "His contributions have been comprehensive, lasting and far-reaching. On behalf of the College of Arts and Sciences, I congratulate Mark, and thank him for his dedication."

Riley, who joined the Florida State physics faculty as an assistant professor in 1991, was promoted to associate professor in 1994, full professor in 1996 and named the Raymond K. Sheline Professor of Physics in 2001. In addition, he served the university's Department of Physics as associate chair from 2003 to 2007 and as chair from 2007 to 2013.

"Florida State is an amazingly vibrant community with faculty performing incredible work, so I am deeply honored and humbled to receive this award," Riley said. "My own research is very much a team endeavor and I have been extremely fortunate to work with some brilliant collaborators and superb students throughout the years. It has been — and continues to be — a lot of fun, and I would not be where I am today without them."

A giant in the field of low-energy nuclear structure, Riley has distinguished himself as a researcher who combines technical expertise to produce the highest quality experimental data with theoretical knowledge to extract meaning from the data to establish new information in the field of nuclear physics. In addition, he has proven himself to be a leader in the field of nuclear science through his service on the nation's most important nuclear science advisory committees, and by the talks he is routinely invited to deliver at international meetings concerning his numerous research collaborations with leading scientists from the U.S., Britain, Sweden and Denmark.

Mark Riley, at right, with Emeritus Professor Ray Sheline, in 2009. Riley had then been named the Raymond K. Sheline Professor of Physics.

As a result of his research, Riley was elected a fellow of the American Physical Society in 2000. The citation praised his "pioneering contributions to the exploration of atomic nuclei at high angular momentum values."

Riley has written 146 articles published in refereed journals, 41 articles published in conference proceedings and delivered 91 invited individual talks. He has presented three series of invited lectures at international nuclear physics summer schools and has written an invited book chapter, "High Resolution Gamma-Ray Spectroscopy: The Gamma-Spheres," in the Encyclopedia of Nuclear Physics and Its Applications," published by Wiley-VCH in 2013. In addition, Riley has written two invited articles in the McGraw-Hill Yearbook of Science and Technology.

As a teacher, Riley's effectiveness and popularity are driven by his charisma, infectious enthusiasm, challenging lectures and pioneering use of new technologies to aid classroom instruction, such as clickers. Florida State honored Riley with University Teaching Incentive Program (TIP) Awards in 1994 and 1997, University Teaching Awards in 1999 and 2007, and with a Distinguished Research Professor Award in 2007.

As a mentor, Riley has served as a major professor to three post-doctoral research associates, 13 doctoral students and three master's students.

In a letter supporting Riley's nomination for the Lawton Distinguished Professorship, U.S. Naval Academy Professor Daryl J. Hartley, who earned his doctorate under Riley's supervision, praised Riley for the "great" and "positive" influence he had on his life.

"Now that I know almost all of the major research professors in the field of nuclear structure, if I could choose any professor at any school, I would not hesitate to choose Mark Riley as my adviser again," Hartley said.

Riley holds two degrees from England's University of Liverpool — a Bachelor of Science with Honors in physics, First Class, earned in 1981, and a doctorate in nuclear physics, earned in 1985. He worked as a research associate at the Niels Bohr Institute at the University of Copenhagen from 1985 to 1987 and as a research associate at the Oak Ridge National Laboratory and University of Tennessee from 1987 to 1988. Prior to joining the Florida State faculty, he served as an advanced fellow at the University of Liverpool.

The Lawton Distinguished Professor Award was first presented in 1957. The

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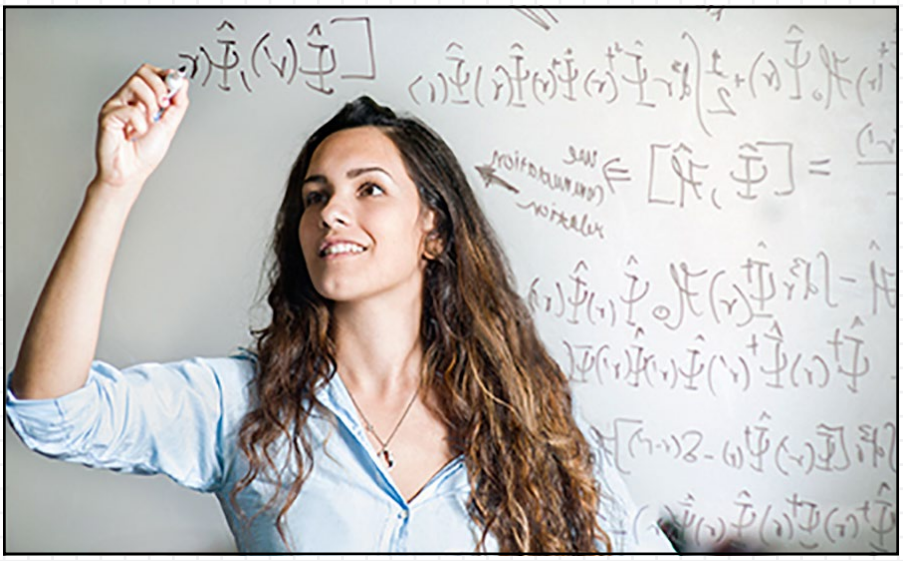
Pawlak unleashes her curiosity in research

When it comes to conducting undergraduate research, Kelly Pawlak has shown herself to be ready for the most intellectual of challenges.

"I encourage my friends and classmates to get into research because I've had such a wonderful experience," said Pawlak, who has been investigating a concept in condensed matter physics known as Bose-Einstein condensation, which relates to a particular type of particle called a boson. Because some atoms have even numbers of constituent particles — protons, neutrons and electrons, which all carry ½ spin and thus have integer spin — they are considered bosons. But not all bosons are atoms; some do not have protons, neutrons and electrons.



Kelly Pawlak

"Because bosons, under the correct conditions, tend to exist in the same state, Bose-Einstein condensation is a really counter-intuitive phenomena," Pawlak said. "As an example, we can imagine a set of 100 ordinary/classical two-state particles to be a set of 100 typical coins. You could flip the set of 'normal particle' coins repeatedly, for an astronomical length of time — say the age of the universe — and very probably never have all of them come up as heads. However, if the 100 coins represent bosons, the chance that all of them would come up heads would be about one in a hundred."

Because of this bizarre statistical property and other strange behaviors that arise from the nonlinearity of the system, the Bose-Einstein condensate can be useful to science and warrants study, according to Pawlak.

As evidence of the outstanding research she has conducted so far, Pawlak was one of four undergraduates who attended the Eighth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena, a large gathering of leading mathematicians and physicists. She made a presentation on her research, "Random Stability in Nonlinear Media: An Investigation of Bose-Einstein Condensates."

"My talk was during the first day and the entire time leading up to it was absurdly nerve-racking," she said. "After a few minutes went by, I forgot that I was even giving a talk, and the rest went smoothly. At the end, a few professors approached me and complimented me on the presentation, which really set the tone for the rest of the conference for me."

Pawlak called her experience at the IMACS conference "great."

"I learned a lot about current topics in applied mathematics," she said. "I think every undergrad interested in academia should attend a conference."

Ziyad Muslimani, an associate professor of mathematics who has been supervising Pawlak's research, described her as "bright, creative and hard working."

"The first thing that caught my attention while working with her was her strong drive for success and passion for research and discovery," Muslimani said. "She invests tremendous amount of energy in thinking about the problem she is trying to solve and never gives up!"

Based on the strength of her research,

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***See other stories, along with this and previous newsletters, on our webpage at* www.physics.fsu.edu**

Resonances IS AVAILABLE IN ALTERNATIVE FORMAT UPON REQUEST.

Bill Moulton: In Memoriam

Kirby Kemper
SPECIAL TO RESONANCES

Bill Moulton passed away on December 23, 2013. Bill would have been 89 on January 4, 2014.

Bill was the founder of our experimental Condensed Matter Program upon arriving here in 1965. He and colleagues from the University of Florida produced a proposal to the Florida Legislature in 1980 to greatly increase both universities presence in the field of Condensed Matter Science that resulted in the formation of MARTECH at Florida State and Microfabritech at the University of Florida.

While Bill was the first Director of MARTECH, his passion was for carrying out experiments and he led the effort to recruit future MARTECH Directors Lou Testardi, Jack Crow and Stephan von Molnár. The National High Magnetic Field Laboratory proposal grew out of MARTECH, with Jack Crow leading this effort and Bill providing constant advice to Jack during this process, based on the experience he gained in working with the Florida Legislature to fund MARTECH.

He continued his research at the NHMFL until the summer of 2012, when health issues forced him to slow down. We will miss his wise counsel in the teaching of undergraduate courses, his specialty, and leading edge science. ❀

Bill Moulton

'Riley'

—continued from page 2

award was known as the Distinguished Professor Award until 1981 when it was renamed in honor of the late Vice President for Academic Affairs Robert O. Lawton. At that time past recipients also were designated Lawton Distinguished Professors. To view a list of all Robert O. Lawton Distinguished Professors, visit http://provost.fsu.edu/faculty/awards/lawton/list.html. ❀

'Wow—What a year!'

—continued from page 1

If you want a challenge for the future, consider this: Jack Crow, when he was in Physics/MARTECH, managed to move the MagLab from MIT to FSU in the early '90's. It's now almost 2015. What should Physics do for an encore? Let's think about it!

[1] We are also noted for being the most congenial and collegial department, but this is not yet a metric in the *US News and World Report* tabulations. ❀

Kurt Koetz Wins Gabor Award, FSU's top staff honor

Mark Riley & James Brooks
EXCLUSIVE TO RESONANCES

Kurt Koetz

We are delighted to report that in April this year, Kurt Koetz was selected as the 2014 recipient of the most prestigious staff award at FSU, the Gabor Superior Accomplishment Award. Kurt has been a member of the physics family for about 20 years now and has done an amazing job in so many areas. He is a problem solver of the first order. We could not function and do what we do as a department without him.

Having said all that, what Kurt has accomplished and achieved in the last one and a half years is nothing short of staggering! During this period, Kurt has been in charge of overseeing the mass exodus in early fall 2013 of all the faculty and almost all the staff and students from the Keen Building, successfully relocating them in a friendly, coherent (keeping groups together whenever possible), expeditious way and then bringing us all back together again! He has brilliantly overseen the logistics of all this, making sure everyone (and we mean everyone) was placed in an environment with the tools they needed—computers, furniture, printers, wi-fi, etc.—to remain efficient and effective. As you can imagine, this was a complete nightmare since we had to rely on the goodwill of our neighbors in nearby buildings to accommodate our special and nontrivial needs. Early this summer, everyone moved back to Keen, and just for extra fun, we are currently undergoing a complete replacement of the air handling systems!

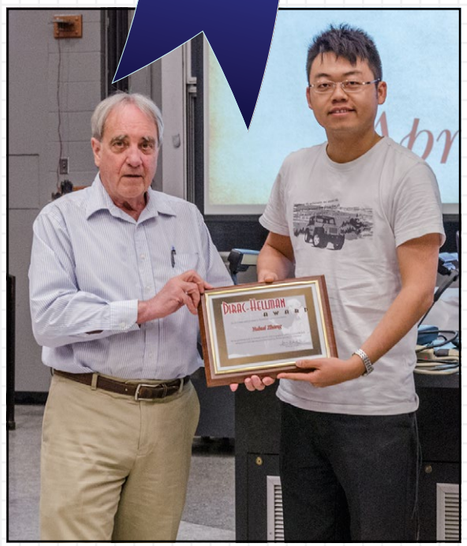
Yes, Kurt has had help and we are fortunate to have so many brilliant staff members within the department who have pulled together majestically to make these processes as painless as possible. But it has been Kurt that has had so many sleepless nights trying to coordinate everything and solve all our collective problems due to us all moving out and then back into Keen. As you may know, physicists are not an easy bunch to keep happy!

In addition, we should also mention that Kurt has worked closely with the project managers from both the company contracted to do all the work on the Keen Building (Wes Callaway) but also from our own excellent FSU facilities division (Gary Feldman). In fact, these two project managers were so impressed with Kurt and so thankful of all he has done that they each wrote wonderful supporting letters for his award nomination. There were also several junior and senior faculty members who have worked closely with Kurt over the last two decades who wrote strongly on his behalf.

Thus it is simply fabulous that Kurt has received this very special recognition from the university. Please join with us in congratulating Kurt on this magnificent achievement and thanking him for all he does for the physics family. We now have two people in physics who have won this, the university's highest honor for staff members, Eva Crowdis in 2010 and Kurt Koetz in 2014!

the PHYSICS AWARDS CEREMONY

Former Chair Mark Riley presents the PAI Award — for "Excellence in Teaching and Research" — to Dr. Volker Credé (at right).



Yubul Zhang, at right, receives the Dirac-Hellman Award from department chair James Brooks.

Dr. Brooks presents the "Atom Award" (the department's highest staff award) to Research Engineer Kurt Koetz. Koetz's many years of excellent service were noted in presenting the award, with particular attention to his efforts coordinating the logistics of the renovation of the Keen Building as it related to faculty and staff. Koetz also won another major award from the university as a whole. For that story, please see page 5.

Dr. James Brooks confers the Dirac Fellowship Award to Wei-Chia Chen.

Peng Xiong, left, presents the Yung Li Wang Award for Outstanding Academic and Research Performance to Kun Yang, who accepted the award on behalf of Mohammad Pouranvari, who was not present.

The Lynn Shannon Proctor Award was presented to Dennice Roberts, at left, by Dr. Susan Blessing.

SPS Inductees, from left: Hampton Black, Drew Blankstein, Christopher Mertin, Spencer Jones, Dennice Roberts, Austin Skeeters, Sam Kahla, and Aaron Magilligan, with Professor Winston Roberts.

Dr. Simon Capstick, at left, congratulates Joon-Il Kim for being named winner of the Novonty Graduate Award.

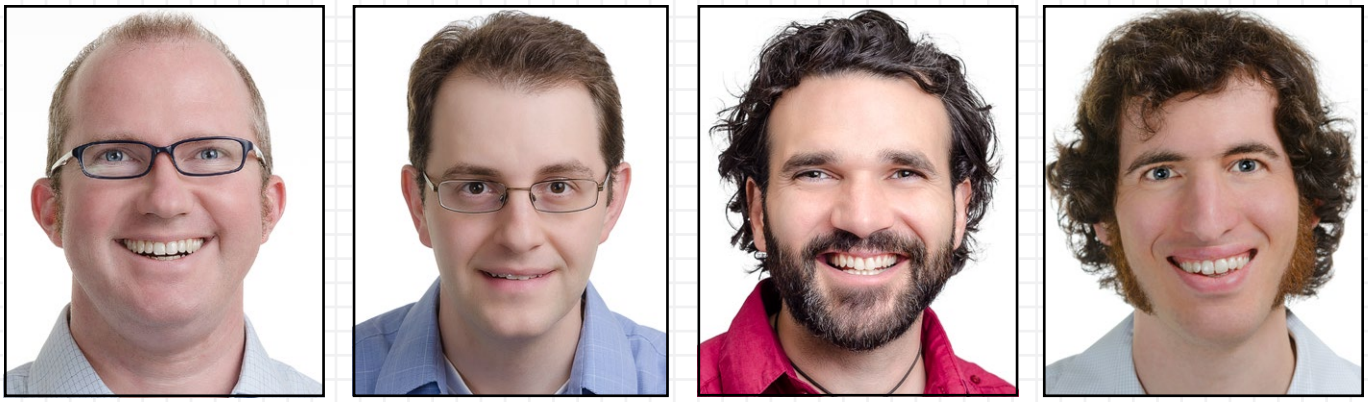
Dr. David Van Winkle, at left, congratulates Joon-Il Kim for being named winner of the Novonty Graduate Award.

Dr. Brooks presents (left to right) Emmanuel Sanchez, Dennice Roberts, and Spencer Jones, all winners of the Lannutti Award for Undergraduate Research.

Dr. Sam Tabor, center, with John D. Fox Award winners Sean Kuvin (left) and Aristeidis Tsaris.

Dr. Brooks with staff members honored for length of service. From left: Melissa Wolff (five years), Roger Beck (15 years), Kurt Koetz (20 years), and Scott Baxter (15 years).

Dr. Vasken Hagopian flanked on the left by Hobuo Sato and on the right by Brendan Diamond. Each was a winner of the Hagopian Family Endowment Award.



Four new members of the FSU Astrophysics faculty, from left to right: David Collins, Kevin Huffenberger, Jeremiah Murphy, and David Rubin.

Astrophysics group hires new stars

Astrophysics is one of the key drivers of the ongoing revolution in modern physics. In particular, the physics of stars and Big Bang cosmology are now at the forefront of modern research, capturing the imagination of students and the public alike. Astronomy and the ongoing quests to understand the nature of "dark energy," "dark matter," and the "origin of chemical elements" attract great interest and are inspiring a new generation of scientists.

In 2006, the Physics Department at Florida State was recognized as one of the leaders in the fields of nuclear physics, high energy physics, and material sciences. These areas are critical components to study fundamental physics and to solve its mysteries. What was then missing at FSU was a strong Astrophysics group. A vibrant astrophysics program was started in 2006 and 2007 with the hire of two faculty members with the specialty of supernovae and cosmology. The group has been quite successful. Its research is well-funded by NSF, NASA, and JPL, and it has hosted international conferences and meetings at FSU.

In 2009, a new degree in "Physics and Astrophysics" was established with a full curriculum involving some eight different lecture courses on the undergraduate and graduate levels. In 2010, a research faculty member with a focus on early Universe cosmology joined our group. As a result, the student population grew to nearly 40 undergraduates and some six graduate students, four of whom each received a PhD in theoretical and observational astrophysics. In the Fall of 2013, our group got a major boost with the addition of four new faculty members whose areas of expertise include star and structure formation, the theory and observations of exploding stars (supernovae), and the cosmic microwave background—the radiation afterglow of the Big Bang. These additions with a wide range of expertise gave FSU the critical mass needed to propel its astrophysics program to the forefront of research.

The astrophysics program has grown rapidly; there is now a broad array of undergraduate and graduate courses. There are over 50 undergraduates, 10 graduate students, and two postdoctoral associates. In addition, the research programs are bustling with enthusiasm—and funds. All members of the astrophysics group are passionately curious about the universe. If you have questions about the Universe (large or small) come to the sixth floor of Keen; our resident astrophysicists are welcoming, and love to ponder the wonders of the universe. ❀

Ten current FSU astrophysics graduate students, from left to right: Paul Dragulin, Tiara Diamond, Erica Bloor, Damien Denis, Vincent Lakey, Brittany Fuzia, Boyan Hristov, Alec Fisher, Greta Chappell, and Felipe Maldonado.

Keen Building gets major facelift, safety upgrades

Beginning last October, the venerable Keen Building—home of most of the FSU Physics Department's administrative offices—underwent a major renovation project which took six months to complete. The result was a significant overall change in the building's exterior appearance.

Named to honor James Velma Keen, one of the founders of the Southern Interstate Nuclear Compact in 1959, the building was designed in the early 1960s (a painting of the nearly final design, dated 1963, hangs in the building on the third floor) byRobert Browne, of the architectural firm of Edwin T. Reeder Associates of Miami. The overall design is of a pair of intersecting rectangles, only one of which touches the ground, surrounded by tapering columns on three sides. The design fits into the "furturist" style popular in the 1960s; it was used for such iconic buldings as the Capitol Records Building and Beverly Hilton, both in Los Angeles, and Walt Disney World's Contemporary Resort Hotel, here in Florida.

The Keen Building's east side, as it appeared in 2010.

This was not the first time the Keen Building's look changed. Built in the mid-1960s and completed around 1967, one of the building's key original features was the inclusion of small, highly-reflective metallic copper-colored tiles on the facings above and below the windows. Ken Ford, a graphic artist who served the department for 37 years, was on campus for Boys' State about a year prior to the building's completion. He remembers those copper tiles vividly, saying that when returned to campus in 1971 as an undergradate, the tile "would catch the morning sun and sparkle like a jewel." Ford reports that in the mid-'80s, the tile—and its underlying concrete substrate—began falling off the building in chunks he described as potentionally "lethal" to passers-by. Accordingly, the tile had to be removed as it was deemed too expensive to replace. "It was very beautiful while it lasted," Ford said.

In early 2013, a similar problem developed with the building's exterior. Again, pieces of the building were falling, endangering passers-by. Barriers were erected to re-direct foot traffic around (and through the ground floor of) the building, keeping a wide perimeter zone free of pedestrians.

Later in the year, the decision was made (and funding secured) to give the building's exterior a major overhaul which would restore safe passage to students, visitors, faculty and staff, while updating the building's appearance. A significant disruption was mandated by this plan; all offices on exterior walls would have to be vacated. This began with the east end of the building in October, with the other two windowed sides being emptied in separate stages. Almost all faculty and staff received temporary offices in other buildings—some in the Nuclear Research Building, others in other science departments, and still others in facilities more removed. A handful of staff members were relocated to interior offices, and most graduate students and some staff who wre already in interior offices were able to stay in place.

After the initial relocations were complete, work began in earnest. Workers removed the interior facing near the top and bottom of windows, exposing the original mounting. This also meant the removal of the last remnants of the fabled copper tiles, which had remained in place on the inside of the building until this point. The window glass was removed, and then cranes were used to lift the concrete shades, which weighed several hundred pounds each, one by one, out of the frames they had occupied for roughly 45 years. New interior fascias and new tinted glass windows were installed, slightly further out than the originals, giving the offices a somewhat larger feel. New blinds were installed, and many of these offices received new carpet as well.

In addition to these improvements, the exterior balcony on the seventh floor had the old railing removed, because it was too short for current safety regulations. Consequently, the balcony had been rarely used over the last 15 years. A new, much safer railing was installed, one that covers almost the entire height of the balcony, but still allows for an open feel and good views of the surrounding campus. And finally, the concrete columns surrounding the building were painted for the first time, taking on a subtle, warm gold hue. And finally, in April of this year, faculty and staff began moving back into the Keen Building.

It took tremendous effort on the part of students, faculty, staff, and construction workers alike, but the Keen Building's facelift will lead to a building safer for all—and continue to serve the Physics Department and Florida State University until the eagerly awaited *new* physics building is built. ❀

Clockwise from top: The new face of the Keen Building, shown shortly before renovations were completed; a fisheye view of one of the construction cranes from the seventh-floor balcony; a crane removes one of the concrete shades in a view taken from atop the elevated walkway; and a nighttime view made in mid-construction.

Department to 'bridge' underrepresented students

The Florida State University Department of Physics has launched a new bridge program designed to help underrepresented minority students achieve a master's degree in physics and then move on to a doctoral program.

The program, launched this past summer, will provide tuition and a stipend to two graduate students per year who are interested in pursuing a doctorate in physics but need additional science and math course work to prepare them for the doctoral program. The students will also gain hands-on work experience through internships at the National High Magnetic Field Laboratory.

"Our main goal is to provide opportunities to highly talented minority students who would otherwise not have gone on to graduate school to pursue a Ph.D. in physics at FSU, or essentially any other physics Ph.D. program in the nation," said Simon Capstick, professor of physics and the bridge program site leader at Florida State.

Funding for the program is being provided by the American Physical Society, which first launched physics bridge programs in 2012 at The Ohio State University and University of South Florida. Florida State University and California State University, Long Beach are only the third and fourth universities in the country to offer such a program in connection with APS.

African Americans, Hispanic Americans and Native Americans currently receive only about five to six percent of all physics doctorates given to U.S. citizens, according to APS.

Simon Capstick

APS will provide $68,000 per year for three years to support the program. That financial support will be supplemented by $10,000 from the MagLab for summer internships, tuition waivers from the Dean of Graduate Studies and teaching assistantships through the College of Arts and Sciences and the Department of Physics.

Capstick and fellow Department of Physics Professor Stephen Hill said the department had been working on increasing diversity in its graduate program over the past few years, specifically looking at recruiting tools, and advising and mentoring strategies.

That work prepared them to successfully apply for the funding through APS and launch the program, Hill said.

"We strongly believe that the physics graduate program can serve as a model for other departments on campus and across the nation," Hill said. "Meanwhile, the goal of the APS Bridge Program is to increase the number of physics degrees awarded to minority students. The proportion of minority physics doctoral degrees is currently way below the national demographics, and even far below the proportion who receive physics bachelors degrees."

The Florida State program will be a two-year master's program, which began July 1 when students started an internship at the National High Magnetic Field Laboratory. The students will continue with course work in the fall.

The ultimate goal, of course, is for the students to then be "bridged" to either the doctoral program in physics at Florida State or another university.

College of Arts and Sciences Dean Sam Huckaba said that the new program is a huge boost to the physics program.

"The funding of the APS Bridge Program grant is a timely bonus for the Department of Physics and the MagLab as they continue to recruit under-represented minorities to Florida State University," Huckaba said. "I was very pleased to learn of their success."

'Pawlak'

—continued from page 3

Pawlak received a 2013 Undergraduate Research and Creative Activity Award from Florida State. The award consists of a $4,000 stipend.

"The URCAA money freed me from the obligation of working over the summer, which led to a lot more time for me to concentrate on my research," she said. "Also, some of this money has gone towards equipment and software for the computational part of my project."

In addition to the URCAA, Pawlak is the recipient of an Honors Thesis Award.

"My thesis project is very broad in scope at the moment, and encompasses both the above project and another manuscript being worked on," she said. "They are both related to Bose-Einstein condensates and are both investigations into the field of nonlinear dynamics."

During her final year of high school, Pawlak was talked out of pursuing physics in college. She began her college career at Florida State as an engineering major, but the coursework didn't click with her interests. After flip-flopping around the sciences, came back to physics full force.

"Since changing majors, school has been a lot less stressful. I'm finally doing what I really want," she said. "I am actually surprised that my GPA has increased since switching!"

After graduation, Pawlak plans to pursue a doctorate in physics and become a tenured faculty member at a strong STEM school, conducting original research in condensed-matter physics and mathematical physics.

"Scientists spend their lives climbing mountains," she said. "We may never make it to the top — we may never find a complete description of the universe — but the climb gives us a new perspective on the world."

The AstroLab is born!

Keen 602 is being revamped into the AstroLab, which will house both the Astrophysics group computer cluster and AST 3721L: Astrophysics Laboratory, taught for the first time this semester by Assistant Professor Kevin Huffenberger. Shown is the core of one of the experiments, a microwave frequency Michelson interferometer, built in our own Machine Shop for use in a lab that measures the Sun's angular diameter. The first racks of the computer cluster have been moved in, with an expansion to nearly double the size of the cluster following later this year.

Hanwei Gao joins FSU Physics faculty

A former postdoctoral research fellow at the University of California, Berkeley, Gao is studying the interactions between light and solid-state materials, as well as the behaviors of electrons and photons at the atomic and molecular levels of materials.

"Development of renewable energy sources, such as solar panels that harvest energy from the sun, is undoubtedly crucial toward a sustainable environment on Earth," Gao said. "I'm focused on understanding how light interacts with certain materials and how electrons migrate across those materials so that we can improve the performance of solar cells to a point where they supplement, and even replace many existing non-renewable energy sources."

Hanwei Gao