

WAKE FOREST UNIVERSITY · DEPARTMENT OF PHYSICS

2019 Physics Alumni Newsletter

The complete web newsletter, collected from its original articles.

ARTICLE 1 OF 5

Homecoming Reception 2019

[View this article on the Wake Forest Physics website](#)



The Physics Department faculty and staff invite you to our **Homecoming reception on Saturday, September 21**. As in the past few years, we are having a joint reception with Chemistry and Biology and a lecture demonstration show. The show is designed to be of interest to everyone including children. **The lecture demonstrations will begin at 10 am on Saturday morning in room 126 of Winston Hall. This will be followed at 10:45 am by a reception in the lobby of Winston Hall.**

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2019 Alumni Award

[View this article on the Wake Forest Physics website](#)



In 2018 we implemented a new alumni award. The award is given out to a Physics Department alumnus for exceptional achievements and/or service. The award is not limited to physics but covers all areas that our alumni excel in. If you can think of someone to nominate, please send a letter to the Department Chair, Daniel Kim-Shapiro or email (shapiro@wfu.edu) describing why that person is a good candidate for this award. Please send nominations by 12/1/2019. Note that the award will have a modest monetary component.

This year's winner is Dr. Randall Ledford ('72). Dr. Ledford accepted the award at a special physics colloquium on April 3, 2019 and gave a talk entitled "Emerson Corporation-A Global Manufacturer of Industrial and Residential Products"

Dr. Ledford is retired from Emerson Electric Company, one of the world's leading electronics companies, where he served as Senior Vice President and the Chief Technology Officer. During his time at Emerson, he also created R&D centers around the world including India, China and Eastern Europe. He was also President of Emerson Ventures beginning in 1997. Prior to joining Emerson, he served as President and

General Manager of several different divisions at Texas Instruments Inc., including the divisions of Digital Imaging, Software, Enterprise Solutions and Process Automation. He began his career with Bell Telephone Laboratories in New Jersey where he worked on UNIX development, fiber optic communication and microwave transmissions. He has served as a director of several companies including Akermin, Inc., Gerber Scientific, Inc., Stereotaxis Inc., Amphenol Corporation and Interphase. Dr. Ledford was a director for the Oak Ridge National Laboratory strategic transition board. He has served on several university advisory boards including Cornell, Missouri, Carnegie Melon and WFU.

Dr. Ledford received a Ph.D. and M.S. in Physics from Duke University and a B.S. in Physics from Wake Forest University. He has endowed two scholarships for undergraduate physics and biophysics majors at WFU.

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Recent Changes

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Significant Changes Over the Past Year

Our administrative assistant, Melissa Mitchell, moved on last fall to the Department of University Advancement. We wish her well. Our new administrative assistant is Kittye McBride. She began working in the Physics Department last December. Prior to coming to Wake Forest, Kittye had a long and varied career. She is originally from West Virginia where at Pipestem Resort she worked her way up to the position of convention services coordinator. She moved with her husband to North Carolina about 25 years ago. Her first job here in Winston was with Xpres Corporation (later changed to Encore) where she spent over nine years as a design center coordinator. While at Xpres, Kittye met Melissa Mitchell and they have remained friends since. After leaving Xpres, she worked as a production manager for Adidas, and a couple additional companies. Most recently she worked in her husband's remodeling business and freelanced for a marketing company. She enjoys organic gardening, antiques, reading mysteries, and spending time with her husband, Wesley, and her dog, Dharma.

In the 2017 newsletter it was mentioned that Richard Williams had retired, but was keeping his laboratory space for two years. Last year we did a search to replace him and another search to hire an additional faculty member. We were successful and have hired Ilaria Bargigia and Ajay Kandada. Ilaria currently is a postdoctoral researcher at Georgia Tech (Georgia Institute of Technology). Ajay is a Marie Curie fellow, dividing his time between Georgia Tech and the Italian Institute of Technology in Milan. They will both be coming to WFU in January 2020. Ilaria, works in ultrafast spectroscopy focusing on the photophysics of conjugated polymers in the context of bio-electronics. Ajay works in ultrafast spectroscopy and quantum optics and develops experimental methods to address important questions in material science. They both received their doctorates in 2013 from the Politecnico di Milano in Milan, Italy.

Rick Matthews announced his plans to retire in the summer of 2020. Rick came to Wake Forest from the Naval Research Laboratory in 1979. He served as department chair from 1998 until 2007. In 2007, he was asked to join the university administration, first as Associate Provost and the following spring as Associate Provost for Technology and Chief Information Officer.

Rick returned to the Department in 2014, at which time he completely reinvented his teaching, adopting a radical "flipped class" approach. He was asked to continue half-time in administration as Director of Academic and Instructional Technologies for the College. His career reflects his love of teaching and of technology. When he arrived at Wake Forest in August of 1979, the University had two computers. Six weeks later, Rick had brought in the back of his car another twelve, the university's first desktop computers. He was called the "most vocal advocate" for the Plan for the Class of 2000 that resulted in the first 1:1 laptop program at any major university. His teaching was recognized with the College Excellence in Teaching Award (1982), the department's Excellence in Teaching Award (2016), and the University's Innovative Teaching Award (2016).

We have begun a search for Rick's replacement. We are planning to hire someone who does theoretical research in condensed matter physics.

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Awards

[View this article on the Wake Forest Physics website](#)

Awards Received by Faculty, Staff and Students

Timo Thonhauser has been awarded the title *Wright Family Professor in Physics*. He is the founding Director of the new Center for Functional Materials and was promoted to the rank of Full Professor on July 1, 2019. The Wake Forest Professorships are endowed positions and are among the highest honors the institution can bestow on our faculty members. The selection criteria included: exceptional skill and sustained dedication in the classroom; outstanding commitment to student learning and growth beyond the classroom; a wide-reaching and significant record in scholarly and creative work; and sustained exemplary service to the Department, the discipline, the College, the University, and the broader scholarly community.



Timo Thonhauser

Three physics majors were named Goldwater Scholars for the 2019-2020 academic year! They are Robert Bradford, Noah Meyer, and Fernando Rigal. The three were chosen from a pool of 1,200 natural science, engineering, and mathematics students who were nominated by 443 academic institutions. Goldwater Scholars have impressive academic and research credentials that have garnered the attention of prestigious post-graduate fellowship programs. A maximum of three scholars are awarded to any single university in a given year and this is the first year that Wake Forest has had three winners. Robert Bradford is currently a senior physics major/math minor doing research with professor Oana Jurchescu; Noah Meyer is currently a junior physics/applied mathematics major doing research with professor Timo Thonhauser; and Fernando Rigal is currently a junior physics/applied mathematics major doing research with professor Daniel Kim-Shapiro.



Robby Bradford



Noah Meyer



Fernando Rigal

Physics Department Outstanding Service Award. Graduate Student Daniel Vickers won the Outstanding Teaching Assistant Award. Graduate student Andrew Zeidell won the Peer Mentor Award. Zach Lamport and Peiyun Li were co-recipients of the Outstanding Graduate Research Award. Jacquelyn Sharpe won the Speas award.



Daniel Vickers & Sam Cho



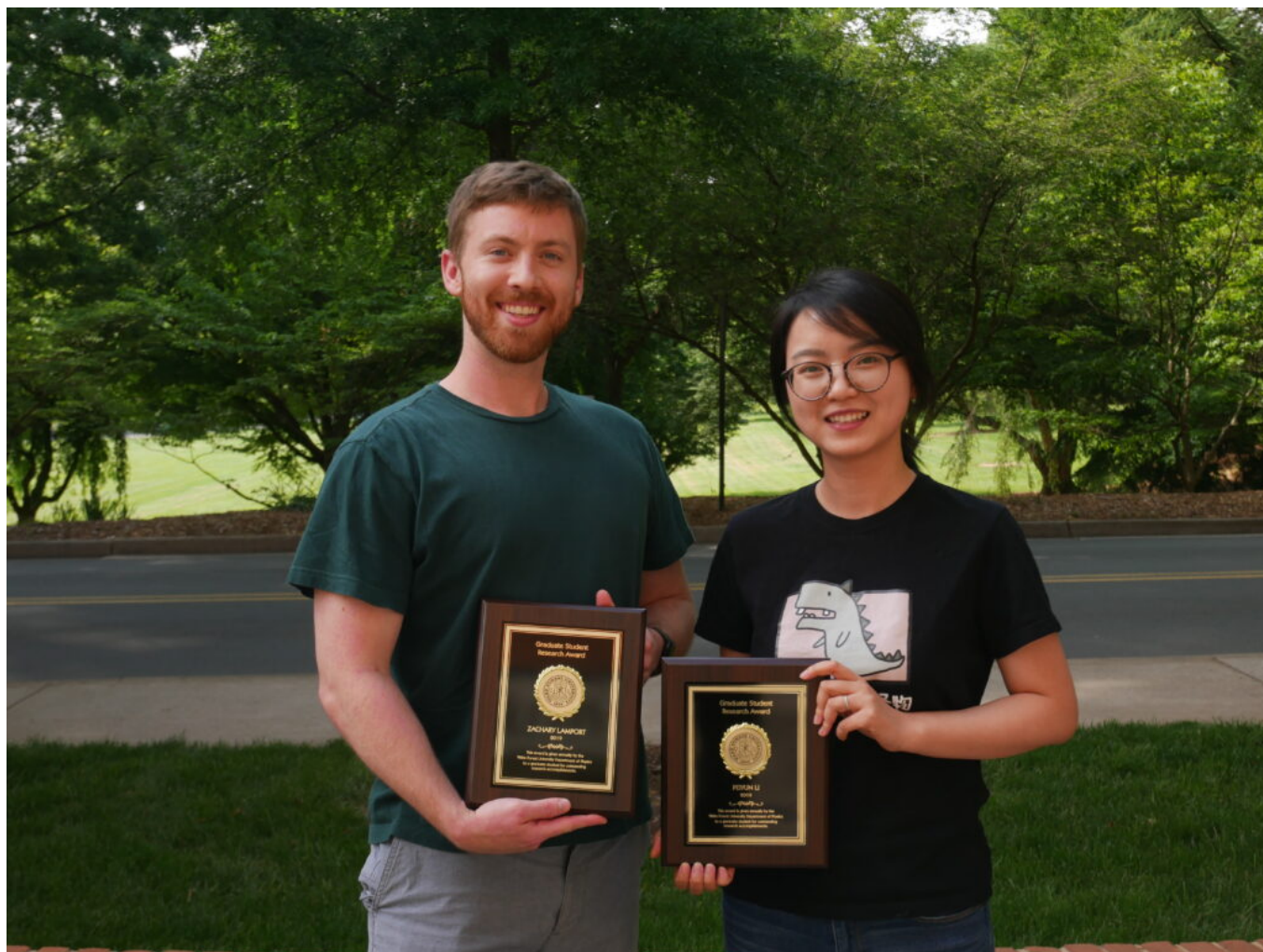
Andrew Zeidell



Jacquelyn Sharpe



Rick Matthews



Zach Lamport & Peiyun Li

ARTICLE 5 OF 5

Faculty Updates

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Daniel Kim-Shapiro



This was a good year for the department, the highlight being our successful recruitment of two new faculty. Thanks for the administration and hard work of our faculty we are getting two new great Teacher/Scholars.

I got to teach Physics 114 again last semester and enjoyed it as usual. Those students are so motivated and a pleasure to teach. We are working on revising some of the associated labs as well as the intermediate labs.

My research group is doing well. Aryatara Shakyra graduated from Salem and is now a grad student in Arizona. She went with me, Ellie Alipour (a grad student), and Fernando Rigal (a Physics undergrad) to the NO Gordon Conference in Ventura CA last January. This year Ellie and Fernando are coming with the rest of the group (Swati, Nadeem, Andreas, and a new undergrad Jacqueline Zhu) to the SFRBM meeting in Vegas in November.

My oldest son is turning 21 and is at the Engineering school at NC State while my other two boys are in high school still.

Do drop by when you are in town.

Paul Anderson



Paul Anderson

Our group grew in size substantially last year with the addition of three new graduate students, Leda Gao, Ian Newsome, and Shohreh Gholizadeh Siahmarzgi. Robert Link continued to work with me throughout the year and Ray Clark worked with me during the spring semester. Ray spent the fall semester in Barcelona, Spain. Both Robert and Ray graduated with BS degrees in Physics in May. Robert, Ray, and the other graduate student working with me, Ritchie

Dudley attended the April American Physical Society Meeting in Denver. Both Ritchie and I gave talks and Robert and Ray presented posters. Ritchie received a Graduate Richter Scholarship from Wake Forest University to spend three months in Valencia, Spain where he worked under the supervision of Alessandro Fabbri at the University of Valencia. I also traveled to Valencia for three weeks and both of us presented posters at the 22nd International Conference on General Relativity and Gravitation that was held there in July. Ritchie also attended and gave a talk at a workshop entitled “Simulating gravitation and cosmology in condensed matter and optical systems” which was held towards the end of July in Trent, Italy.

In addition to the travel, since the last newsletter two papers have been published and one accepted for publication that include current and former students as coauthors. One paper which was on zero temperature black holes that do not evaporate due to the Hawking effect had former graduate student Mathew Binkley along with former undergraduate students Jillian Bjerke and P. Wilson Cauley as coauthors. A paper on certain types of Bose-Einstein condensates which can serve as analog black holes had Ritchie Dudley as a coauthor along with two external collaborators Roberto Balbinot and Alessandro Fabbri. A paper has been

accepted for publication with Ray Clark as a coauthor along with two external collaborators Alessandro Fabbri and Michael Good. In it we studied the details of black hole evaporation at late times well after the black hole has formed.

Keith Bonin



Last year was the first year that Keith Bonin served as Associate Provost for Research and Scholarly Inquiry. Responsibilities include supervising and enhancing research endeavors at all of the schools at Wake Forest, as well as the College. Last academic year he visited three universities who have implemented new programs, recruitment strategies, and practices that have resulted in a significant increase in externally funded research expenditures over the last decade.

This effort has the goal of adopting and modifying some of these practices to catalyze a similar increase in the years ahead at Wake Forest. In addition, last September (2018) he was awarded a 5-year NIH grant (as a co-PI) to study chromatin dynamics in human cells with the goal of understanding the mechanisms of therapy induced cancers. These are cancers that are induced by the cancer treatment, and are usually fatal in most cases. Last year 6 undergraduate students and one graduate student were engaged in research related to this project. Prof. George Holzwarth also worked on this project as a collaborator throughout the year. Finally, he again taught the Intermediate Physics lab course, which is a lab course tightly aligned with the Modern Physics course offered to sophomore Physics students.

Sam Cho

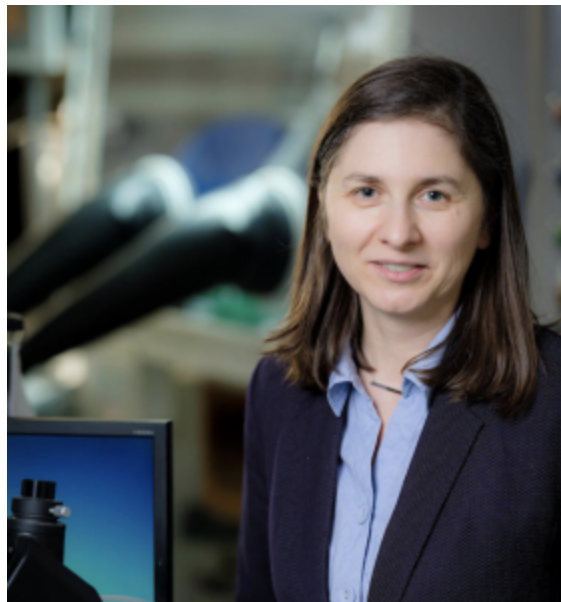


This past summer, I traveled to San Diego to speak at a two day symposium for my former professor, Katja Lindenberg. She was retiring after 50 years at University of California, San Diego, which is where I received my Ph.D. She used to introduce me as “a former TA who stayed on as a friend.” Katja had a very distinguished and accomplished career (it is pretty rare to be honored with a symposium for a retirement), and her career is even more amazing when you

consider that she was an immigrant from Ecuador and often the only woman at conferences in her field.

To me, however, Katja was someone who took the time to listen and encouraged me to be a better teacher. Thanks to her letter of recommendation, the first one she ever wrote for a TA, I received a university-wide Teaching Excellence Award. It remains my most precious award. Indeed, when I received a university-wide award from Wake for mentoring and teaching and just last semester a Physics Faculty Excellence in Teaching Award from the Physics Dept., Katja was the second person I told (after my wife, of course).

As it turns out, I am not the only one at Wake to have a connection to Katja. When I interviewed here at Wake about 9 years ago, I met with Bill Kerr, a Professor Emeritus in the Physics Dept. Before long, we realized that Katja was a mutual friend because Bill had shared an office with Katja in the same Ph.D. graduate research group at Cornell. What a small world! Towards the end of the conversation, he said, “If you’re a friend of Katja’s, I’m sure that you will love it here like I did.” Turns out, Bill was right, as always.

Oana D. Jurchescu

The Jurchescu research group welcomed one new graduate student (Ryan Sullivan), and one undergraduate student (David Filston). Group member Dr. Zach Lamport started a postdoctoral researcher position at Columbia University and Dr. Peter Diemer moved to WFU Medical School on a research scientist position. Undergraduate student Robby Bradford was named a Goldwater Scholar and he also received a fellowship that supported his research at Duke University over the summer. Former undergraduate student Sajant Anand won a

National Science Foundation fellowship from the Graduate Research Fellowship Program (which he declined) and a National Defense Science and Engineering Graduate fellowship that will support his PhD studies at UC Berkeley.

Prof. Jurchescu gave seven invited talks this year at major conferences in the field, which took place in US, Singapore, Sweden and Croatia. She also organized two international conferences: Symposium EP06: Organic Electronics—Materials and Devices at the Materials Research Society (MRS) spring meeting, April 2019, Phoenix, AZ, and the Symposium on Organic and Hybrid Field-Effect Transistors XVIII at the International Society for Optical Engineering (SPIE) Annual Meeting, August 2019 in San Diego, CA. In March she became member of the Division of Materials Physics Executive Committee of the American Physical Society.

Rick Matthews



In the last academic year, I have been able to put into practice the latest tweaks in how I teach first year physics. I mentioned in the previous newsletter that I radically changed the way I teach after returning from seven years in administration, with students viewing lectures via short videos the department produced, and using class time for interactive problem solving. I decided that I do not want to waste a minute of the time I am with my students doing things that

could be done as well or better when we are not together. Thus, the students view lectures online, freeing up class time for students to work in small groups on hard problems. This way students encounter their gaps in understanding when we are all together and can quickly resolve them. My students learn more than before, and they report preferring this approach.

As of two months ago, I have four grandchildren. I have seriously embraced the role of “granddaddy”, and am doing all I can to hook them all on science. McKinley, when asked how she liked her first day at Disney World, replied “Great, but tomorrow can we go to SciWorks [the Winston-Salem science museum]?” So, I think it is working. Please visit when you are in town, and I will show you pictures!

Fred Salsbury



Fred Salsbury

The Salsbury group has been busy since our last update in the 2016-17 academic year. Since then Ryan Melvin and Jiajie Xiao both defended their dissertations and both are working in industry using machine learning & modeling; in finance and pharma respectively. Both also earned Masters; in statistics and CS respectively, and Ryan also earned a certificate in Structural & Computational Biophysics. Terra Colvin also graduated with his MS in physics and continues to work for the Cancer Center. Cenji Yu, a former undergraduate researcher, graduated, received honors in

physics and is currently a PhD in Medical Physics at MD Anderson. In other news, Dr. Salsbury was promoted to full Professor and has been a faculty liaison to the TLC organizing workshops and panels for and by faculty in teaching, especially regarding computation in courses.

Timo Thonhauser



This past year was very eventful for Prof. Thonhauser. On July 1, 2019 Prof. Thonhauser was promoted to Full Professor of Physics. At the same time, he was also awarded the endowed chair and title of *Wright Family Professor in Physics*. In terms of research, we are happy to report that Prof. Thonhauser got his long-

standing DOE support renewed through a \$1,250,000 grant, this makes 11 years of continuous DOE support. This past spring, Prof. Thonhauser was also able to open his *Molecular Playground* exhibit at our local science museum Kaleideum to the public, see <https://cfm.wfu.edu/outreach> for pictures. This exhibit educates children and adults alike about the fundamental building blocks of nature—atoms, molecules, and solids—and was made possible through Prof. Thonhauser's NSF support. Finally, last year was also the first year of the newly established *Center for Functional Materials*, see <https://cfm.wfu.edu>, where Prof. Thonhauser serves as the founding director.