WAKE FOREST UNIVERSITY · DEPARTMENT OF PHYSICS

2021 Physics Alumni Newsletter

The complete web newsletter, collected from its original articles.

ARTICLE 1 OF 5

Homecoming Reception 2021

View this article on the Wake Forest Physics website

September 2021

The Physics Department faculty and staff invite you to our **Homecoming reception and demo show on Saturday, October 30**. As in the past several years, this will be a joint event with Chemistry and Biology. However, the venue will be different this year. We will join the Festival on the Quad which will either be from 9am-noon or from 3:00-5:30pm, depending on game time. We will have two small tents near the steps of

Wait Chapel. Due to the duration of the event, many of the demonstrations will be continuous and some will be “hands on”. The demonstrations are designed to be of interest to everyone including children. Please stop by, we would love to chat with you and have you check out the demos.

ARTICLE 2 OF 5

2021 Alumni Award

View this article on the Wake Forest Physics website

September 2021

In 2018 we implemented a new alumni award. The award is given 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 12/1/2021. Note that the award will have a modest monetary component.

Alumni News

Do you have news that you would like to share in the newsletter? Look for an email from us in late August asking for your contributions.

ARTICLE 3 OF 5

Recent Changes

View this article on the Wake Forest Physics website

Significant Changes Over the Past Year

The Physics Department Business manager, Gloria Stickney retired on February 28, 2021 after being here for over twelve years. In 2020 Gloria won the Physics Department Outstanding Service Award. She has been replaced by Heather Chapman who was previously an administrative assistant working in the Physics Department Main Office. We wish Gloria a happy and fulfilling retirement.

Very recently we found out that one of our faculty members, Ilaria Bargigia, is resigning as of January 1, 2022. Ilaria joined the Department in January of 2020. We are sorry to lose her but wish her well.

In the spring of 2019, we hired Ajay Srimath Kandada. Unfortunately, Ajay, who planned to come in January of 2020, is still held up by ongoing travel restrictions related to the corona virus.

We are very sorry to report that Richard Williams passed away on July 5, 2021 after a short bout with AML leukemia.

Professor Williams earned a BS in physics at Wake Forest in 1968 and was the first Speas Award recipient for distinguished work in physics (the highest undergraduate award). He then earned an MA in 1971 and a PhD in physics in 1974 at Princeton.

After a successful early career at the Naval Research Laboratory, he was recruited back to Wake Forest as the Reynolds Professor of Physics. Professor Williams increased the reputation and visibility of the Wake Forest physics department by helping to establish its PhD program in the 1980s. He mentored the first physics PhD graduate and was the first endowed professor within the Department. After formally retiring from the University in 2017, Professor Williams remained active in research at the Wake Forest Nanotech Center. A complete memorial and obituary can be found at https://www.salemfh.com/obituaries/Dr-Richard-T-Williams?obId=21659950#/obituaryInfo.

Changes due to the pandemic

Of course, there have been some significant changes in the classroom due to the pandemic. Last year classes began for the fall semester in late August with a delay of just a couple of days. Faculty were given the option of teaching face to face classes, blended classes with some students physically present and some attending online, and completely online classes. At all times and in all classrooms, everyone was required to wear a mask and observe social distancing. As a result, many fewer students were allowed into a classroom than normal. Therefore, those physics faculty who preferred to teach with students present taught blended classes.

This year the University has reinstated face to face classes. Shortly before classes began in August the University implemented a mask rule stating that everyone interacting with others indoors on campus must wear a mask except for people giving lectures if they can stay at least 10 feet away from the audience members at all times. The mayor of Winston-Salem followed the next week with a similar rule for the city. However, there is no social distancing requirement, so we are having face to face classes as planned.

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Awards

View this article on the Wake Forest Physics website

Awards Received by Faculty, Staff and Students

Professor Oana Jurchescu has been named the Baker Family Professor of Physics. The Professorship began on July 1, 2021. Dr. Jurchescu was formerly a Denton Family Fellow. Dr. Jurchescu has been a model teacher scholar since she arrived at Wake Forest in 2009. She has won the Wake Forest University Reid-Doyle Prize for Excellence in Teaching, the WFU Award for Excellence in Research, the Kulynych Family Omicron Delta Kappa Award, and the URECA Award for Excellence in Mentorship in Research and Creative Work. She has brought in almost 10 million dollars in external grant funding to run her world-class research program in organic electronics.

Dr. Jurchescu also received the 2019-20 Graduate School Student Association Faculty Excellence Award. This award is to recognize a graduate school faculty member for his/her service to advance the graduate school program. The recommendation letters for the award were provided by graduate students and focus on the time devoted to interaction with the students, the commitment to the educational process, and excellence in teaching/mentoring.

Ph.D. graduate, Hamna Iqbal, won the 2021 Gordon A. Melson Outstanding PhD Student Award. This is a university award that recognizes performance in research productivity, quality, originality, importance, and impact in the field, along with an outstanding academic record, activity in the discipline and university, and departmental citizenship.

Noah Meyer, a Physics Major who graduated in May 2021 was selected to receive a 2021 National Science Foundation (NSF) Graduate Research Fellowship (GRF). The NSF's Graduate Research Fellowship Program (GRFP) recognizes and supports individuals early in their graduate training in the fields of Science, Technology, Engineering, and Mathematics (STEM). This highly significant national accomplishment places Noah amongst an elite group of fellows who have gone on to distinguished careers in STEM or STEM education.

The following Awards were presented at our Annual Physics Department Awards Ceremony in May:

Dr. Stephen Baker, current Teacher-Scholar Postdoctoral Fellow and Alumni received the Physics Department ***Excellence in Teaching Award***.

Trevor Jenkins

Ryan Sullivan

Taylor Ordines

Trevor Jenkins, Ryan Sullivan, and Taylor Ordines were co-recipients of the ***Outstanding Teaching Assistant Award***

Hamna Iqbal

Yan Li

Hamna Iqba and Yan Li were co-recipients of the ***Outstanding Graduate Research Award***

Noah Meyer

Fernando Rigal

Noah Meyer and Fernando Rigal were co-recipients of the ***Speas Award***

Graduate Student Saif Ullah received the
Peer Mentor Award

Kevin Woytowich, Parker Hopkins, Noah Meyer, Parker Cabiness, and Zezhong Zhang were co-recipients of the ***Major Field Tests Achievement Awards***

ARTICLE 5 OF 5

Faculty Updates

View this article on the Wake Forest Physics website

Daniel Kim-Shapiro

Although we have a way to go, things are starting to seem more like they used to. With pretty close to 100% vaccinated students, faculty and staff, academic life on campus is very active. Classes are pretty much all face to face and labs are buzzing. I was just remarking today how in the past month or more, I have only used my home office to zoom with my son at Reed College in Oregon.

On the other hand, our plans for my research group to go to the Society for Redox Biology and Medicine meeting in Savannah Georgia next month were canceled when they decided to go 100% virtual. We will still present work, but it will not be the same. The lab is doing well with graduate students Ellie Alipour and

Laxman Poudel and our star undergraduate student Emily Foley who worked over the summer with us. Of course, Swati Basu is leading the lab still. Fernando Rigal in in graduate school now at UIUC. I am sure he will excel.

My youngest son is now a senior in HS, my oldest has one more semester at NC State, and (as mentioned above) my middle son is at Reed College. My wife is doing well saving lives as a Pathologist.

I do hope to see people at homecoming this year. Please reach out and let us know how you are doing.

Paul Anderson

After a year of working mostly at home, it is really nice to be spending most of my work time on campus again and teaching a face-to-face class, even with all of the students wearing masks. I found that I can teach in the online and blended formats, but I much prefer teaching face to face.

I was on sabbatical in the spring semester last year but in part because of the pandemic I chose to stay at Wake Forest. My research group currently consists of Zach Scofield who is an undergraduate physics major and two graduate students, Shohreh Gholizadeh Siahmazgi and Ian Newsome. Zach received a URECA fellowship that allowed him to work with me over the summer. During the past year, I have published a paper with Shohreh which includes former undergraduate Ray Clark and an external collaborator as coauthors. It

relates to the computation of quantum effects due to the formation of a black hole. I also published one with Ian which also includes former undergraduate and current graduate student Robert Link as well as two external collaborators as coauthors. It relates to the validity of a certain type of approximation that is often used to describe what happens when particle production occurs due to the presence of a strong electric field.

Keith Bonin

Last year was the third year that Keith Bonin served as Associate Provost for Research and Scholarly Inquiry. He was reappointed for three more years, starting July 1, 2021. Responsibilities include supervising and enhancing research endeavors at all of the schools at Wake Forest, as well as the College. At the end of the last academic year (June 30, 2021) he submitted the final set of long-term recommendations for improving the research environment at Wake Forest from the Research & Discovery Task Force. The charge of this task force was to articulate strategies that will help Wake Forest to significantly increase externally funded research in the future. The report was submitted at a propitious time, as we embark on a new chapter in Wake's history with a new president at the helm.

He continued to work on 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 we had 5 undergraduate students, two graduate students, and two postdocs engaged in research on this project. Prof. George Holzwarth also worked on this project as a collaborator throughout the year. Prof. Bonin also started collaborating with computer science researchers at UNC-Greensboro to apply machine learning methods to images generated by a novel microscope for this project. 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

The past year has been very eventful, and we are all going through massive changes to adjust to our new lives. Although there are a lot of tough challenges, I want to focus on the positives. I am reminded of an interview of Fred Rogers (from “Mr. Roger’s Neighborhood”) where he quoted his mother who said, “Always look for the helpers.”

Several of you reached out with very nice emails, and I can’t tell you how much they meant to me. As I was juggling research, teaching, service, and personal responsibilities, it was great to hear how you were doing. One of you even pointed out that I didn’t write up a faculty update for the alumni last year, and I was ashamed to admit that I just assumed that no one read it! For others, it was really cool to talk over Zoom just like old times, virtually attend a White Coat Ceremony, and even virtually attend a wedding. These are all events that probably would not have happened before the pandemic. A couple of you even visited in-person – so I got to see you in all three dimensions! I suppose four if you include time, and I appreciate very much the time all of you shared. Interacting with all of you has been an enormous source of positive energy during the solitude of the pandemic, and that energy has helped me keep positive for my current students that are here.

I am also particularly impressed with some of my former students who reached out to me in the aftermath of George Floyd and asked how they could help. Honestly, my answer to that is still, “I don’t know”, but there does seem to be a lot of opportunities. As a member of the Biophysical Society Committee for Inclusion and Diversity, a committee I joined after being inspired by one of you, I co-wrote an article about the work the Biophysical Society is doing to promote inclusion. One of my former computer science students asked me to help organize a career panel here at Wake of successful underrepresented alumni. Another set of students asked me to lead a student panel for the Wake Forest Pre-College “Exploration in STEM” program to inspire middle school students. I am continuously inspired by how socially conscious and responsible young people are these days. Our alumni and students are not just looking for the helpers, they are *being the helpers* too.

Professionally speaking, it has been pretty busy here. I recently became the Computer Science Department Graduate Director and also Co-Director of the Data Science Certificate Program. Together with the HPC Team at WFU Information Systems, I am leading a team of undergraduate students in a high-performance computing competition at the world’s leading supercomputing conference for the fourth year in a row. Inspired by our own Rick Matthews and Jack Dostal who pioneered flipped classrooms in the Physics Department, I completely overhauled and “flipped” all of my classes when I went hybrid and virtual, and I am sure that I will continue well after the pandemic. A particularly excellent former biophysics research student, now a Ph.D. candidate, helped open up a fruitful collaboration with her current advisor.

On a personal note, my wife and I basically decided to relax as much as we could for the entire summer. That basically meant a lot of socially distanced traveling, running long distances, and making our dog, Chloe, feel like the pandemic is the best time of her life. Indeed, she sat on my lap and listened to introductory and upper/graduate level physics and computer science lectures for over a year. At this point, I feel like Chloe deserves some sort of honorary WFU degree.

For sure, I glossed over all the challenges in the past year, and they are many. However, I continue to be thankful that I don’t have far to look for the helpers, and they are many too.

(Note: I didn’t write any alumni names here and that is because I didn’t have time to ask for permission and wanted to respect everyone’s privacy. That said, Billy, tu as raison, et je suis content d’avoir écrit ça. Merci beaucoup et à bientôt.)

Martin Guthold

Wow, what a strange year it has been. The only constant in the last year seems to have been continued change and uncertainty, requiring ongoing and exhausting adoption. COVID, which we thought would be under control in a few months, proves to be annoyingly persistent.

Despite these challenges, there is quite a bit of positive and exciting news from the Guthold lab and its current and recently graduated members.

Three students graduated with a PhD this last year; Ali Daraei (PhD, 2020), Hyunsu Lee (PhD, 2020), and Melissa Pashayan (PhD 2020, mentor, Dr. Macosko). Ali is a post-doc at UCLA, Hyunsu is a post-doc at WFU, working in the Vidi, Bonin and Guthold labs, and Melissa Pashayan will likely be an instructor at a local university.

It is amazing that despite the COVID-related slow-down, three students graduated with a PhD. All the best wishes to our graduates. You will have a bright future!

We miss these students, and they left a gap in lab. The lab needs to be rebuilt a bit. Luckily, Hyunsu stay around for a post-doc, and we also have very strong continuing students. Three undergraduate students – Rich Pope, Annie Brigham and Caleb Sawyer; one graduate students – Nouf Alharbi are continuing. In addition, former graduate student, Dr. Stephen Baker (PhD, 2015), returned to Wake Forest (Guthold/Bonin

lab) as a teacher/scholar post-doc a couple of years ago. He is working in the Bonin/Guthold lab. Additionally, and excitingly, new students joined the lab; undergraduate students, Joe Cho, and graduate students Zezhong Zhang and Can Cai. A strong team to move the lab forward.

All the excellent work by the research team resulted in several high-impact publications. The Guthold lab published papers in *Nanomaterials*, *Biochimica et Biophysica Acta – General Subjects*, *Biomolecules* and *Acta Biomaterialia* and abstracts in *Biophysical Journal* and *European Biophysics Journal with Biophysics Letters*.

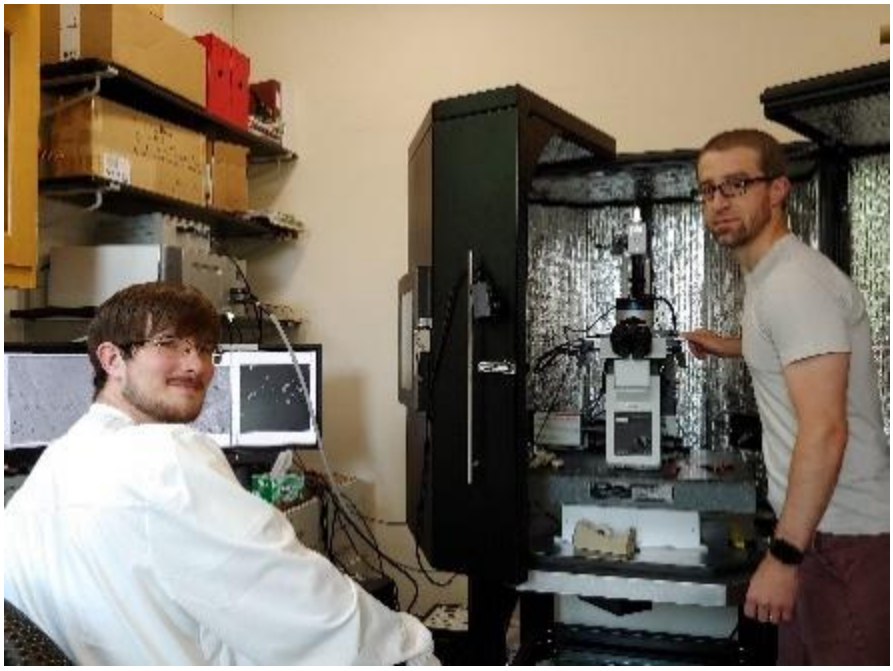
Dr. Guthold helped to organize of the International Fibrinogen Research Society Mini-symposium, June 15th & 16th, 2021. About 140 attendees discussed the latest advances in basic, clinical and bioengineering research relating to fibrinogen and factor XIII.

We are settling into our new lab space in Olin 213 and Olin 216 (now shared with Drs. Macosko, Holzwarth and Kim-Shapiro). We continue to do research in hemostasis & thrombosis (properties of fibrin clots); cancer and thrombosis; mechanical and structural properties of normal and cancerous mammary (breast) cells; electrospun nanofiber properties; and drug discovery. This research is supported by grants from the NIH, the Wake Forest Center for Functional Materials and a Wake Forest Collaborative Grant.

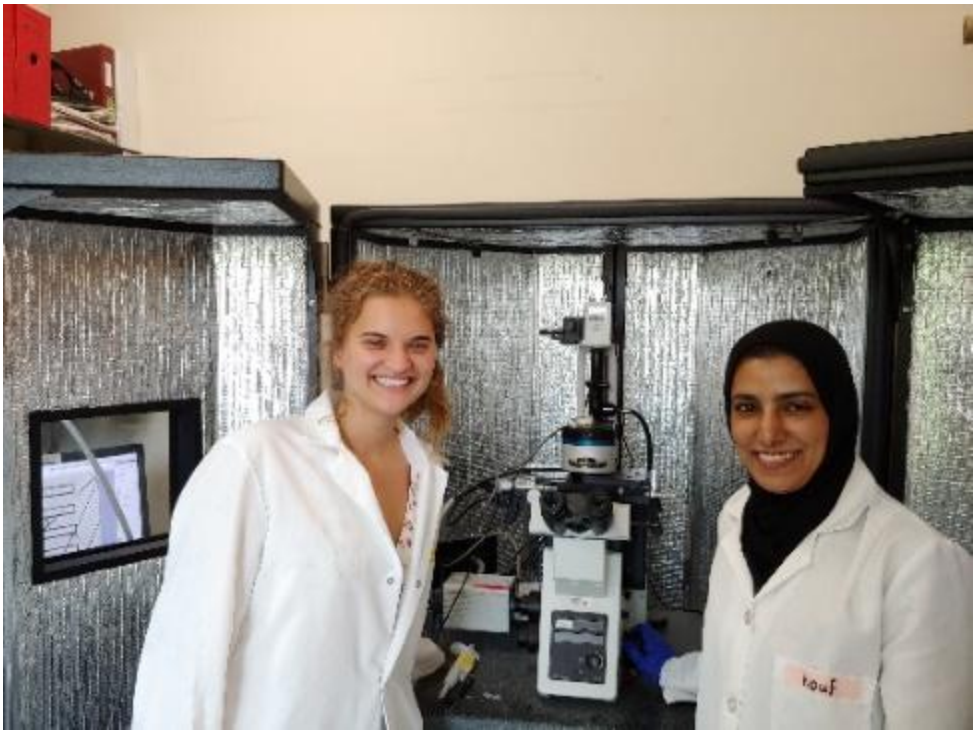
Teaching, and being taught, in a blended and online fashion, has been a big challenge over the last year. It is more difficult to truly engage with students. It is encouraging to see schools and universities moving to in-person teaching. Vaccinations and masks help!

The Guthold family is doing well and there are some big news items, too. My son, Felix, got married in Aug. 2021! The wedding in Germany was beautiful and exciting. Our daughter, Melissanthi, started college at Duke University, now we got two Blue Devils in the family, my wife and daughter. But one better, stronger Demon Deacon. Our son, Alexander, is in 3rd grade, and we are all happy that it is in-person schooling; online schooling last year was very, very exhausting.

We would love to hear from all alumni. Let’s stay in touch.



Caleb & Stephen



Annie & Nouf

Martin & Hyunsu

Natalie Holzwarth

It seems very likely that the years 2020-2022 will be debated by historians and psychologists for years to come. As an academic and a computational/theoretical physicist, one has to feel very lucky that it was possible to avoid much of the trauma of the pandemic. On February 29, 2020, Natalie Holzwarth, together with graduate students Yan Li, and Lindsey Grey and Gabe Marcus from Dave Carroll's group enjoyed a nice dinner in Denver, Colorado in anticipation of the 2020 March meeting of the APS. Later that evening, we were notified that the meeting had been cancelled and, together with hundreds of other disappointed physicists, scrambled to get home. Since then, we have learned to use zoom and are slowly venturing back to some in-person activities.

The big event for 2021 is that Yan Li will complete her Ph. D. thesis on "First Principles Investigations of Electrolyte Materials in All-Solid-State Batteries" in time for the Dec. 2021 graduation date. She will have completed her graduate studies in 4.5 years with 4 publications and 3 additional projects close to completion. Congratulations Yan!

On a personal note, George and Natalie have been enjoying interacting with their two grand children (ages 10 and 0.6) and their parents, usually via zoom and other media and occasionally in person.

Timo Thonhauser

In the spring of last year I took a student group on a semester-long study-abroad program to the Flow House in Vienna/Austria, teaching the two introductory physics classes PHY 113 and PHY 114. While the program was off to a good start, it got cancelled half-way through due to COVID and it was quite stressful to bring all students home with the onset of heavy travel restrictions. The following transition to online teaching went fairly smooth and I even heard some students say that they prefer online classes over in-person ones. In the meantime I taught PHY 741 (Graduate Quantum Mechanics) and PHY 344 (Undergraduate Quantum Mechanics) online and I am now back in the classroom with PHY 741 again.

Scientifically, this past summer I finished a grant from the National Science Foundation, studying the description of weak forces that nonetheless play crucial roles in many materials. In addition, I also have an active DOE grant as PI, overseeing a three-university collaboration on the study of metal organic frameworks. This grant also brought on a new post-doc (Dr. Saif Ullah). This spring we also graduated Noah Meyer, who won the WFU Physics Speas award, a NSF GRFP, and a Goldwater Scholarship—he is now enrolled in the physics graduate program at Cambridge University.