

Schrödinger's Tiger



The Clemson University Physics and Astronomy Newsletter

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Clemson Ph.D. Student Receives Prestigious NASA Hubble Fellowship

Clemson University Ph.D. candidate **Lea Marcotulli's** study of supermassive black holes takes her to the farthest reaches of the universe. This fall, it will take her to the Yale Center for Astronomy and Astrophysics as a part of the NASA Hubble Fellowship Program.

Marcotulli is the first Clemson graduate student to receive the fellowship, one of the world's most prestigious and competitive postdoctoral research prize fellowships in astrophysics. NASA selected twenty-four fellows out of more than 400 applicants.

"I feel deeply humbled and honored to have received this fellowship.

This award is truly one of the most amazing achievements of my career. I could have never accomplished it without the help and support of my adviser, my research group, and all the amazing people here at Clemson," said Marcotulli, who expects to receive her Ph.D. from the College of Science's Department of Physics and Astronomy in May.

Each fellow will receive up to three years of financial support to do research corresponding to one of three broad scientific questions NASA seeks to answer about the universe:

- "How does the universe work?" (Einstein Fellows);
- "How did we get here?" (Hubble Fellows);
- "Are we alone?" (Sagan Fellows)

Marcotulli's research falls in the first category.

"Nearly every young researcher in astrophysics applies to this program and very few succeed," said **Marco Ajello**, an associate professor in physics and astronomy who is Marcotulli's adviser.

"Lea's success testifies to her superb capabilities as a researcher, leader, communicator and mentor to young and fellow students. It also shows that our graduate program can now compete with some of the best graduate programs in the U.S. and can successfully provide the perfect environment for talented young scientists to grow and thrive."



Lea Marcotulli will join the Yale Center for Astronomy and Astrophysics.

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A Message from the Chair

I hope this latest edition of our newsletter finds you healthy and doing well. It has been a challenging year for most, but it is heartening to see the light at the end of the tunnel. Thanks to the heroic efforts of our outstanding staff, faculty, and students we have continued to be successful at realizing our mission of expanding the frontiers of knowledge by pursuing research integrated with education. This academic year we saw twenty of our physics majors complete their bachelor's degree, and nine of our graduate students complete their Ph.D. This fall, we are anticipating one of our largest classes of incoming graduate students in recent years – twenty-three! The accomplishments of our faculty and students continue to impress me, as I trust they will you, as you read through some of the highlights of our accomplishments over the past year in this newsletter.

We couldn't do this without your support. The gifts you have generously provided to fund scholarships, graduate student fellowships, endowed chairs, and the Physics and Astronomy Advancement Fund are key enablers for us to pursue top talent and support the members of our department in their scholarship and teaching. As we prepare for a new academic year, I hope you will consider giving to advance our mission.

Go Tigers!

Dr. Sean Brittain
Chair, Department of Physics and Astronomy
Voice: (864) 656-3416/email: sbritt@clermson.edu

Creating a Legacy — Giving to Clemson Physics & Astronomy

You can create a lasting legacy through your donation to the Clemson University Physics and Astronomy Department Foundation. Endowments to Clemson assure the best faculty, the brightest students and the most creative research projects. A substantial endowment can transform a good university into a great one. As a non-profit organization, the Foundation is exempt from federal income tax under Section 501 (c)(3) of the IRS Code, as amended.

The Foundation has been classified by the IRS as a public charity operated for the benefit of a state university as defined in the Internal Revenue Code of 1986 Section 170(b)(1)(A)(iv). Contributions to the University through the Foundation by individuals, corporations, organizations and other foundations qualify as tax deductions. There are several ways to donate. You may send a check to the Clemson University Foundation, P.O. Box 1889, Clemson, SC 29633.

Checks should be made payable to the Clemson University Foundation with Physics and Astronomy specified on the memo line. Alternately, you may visit the Clemson website: <https://cualumni.clemson.edu/give/physics-astronomy> and make a secure electronic donation. Thank you, as always, for your continued support of the department.

You may contact the Annual Giving Office at (864) 656-5896, should you have any questions regarding your donations. If you have other questions, you may contact the department directly at (864) 656-3416.

During her time at Clemson, Marcotulli has focused her study on supermassive black holes formed when the universe was just 1 billion to 2 billion years old.

“Supermassive black holes at the centers of galaxies are some of the most powerful and fascinating objects in the universe. There is so much we still don’t know about them,” said Ajello, who once led an international team that measured all of the starlight ever produced in the observable universe.

“Marcotulli’s research answered questions about how these objects grow and evolve throughout the history of the universe and how they power the bright emission we detect at X-rays and gamma rays.”

Lea Marcotulli is a sixth-year graduate student in the Department of Physics and Astronomy.

Marcotulli’s work at Yale will center on unveiling the hidden connection between supermassive black holes and mechanisms that trigger jets from the centers of galaxies. During her fellowship, Marcotulli will work with Yale Center for Astronomy and Astrophysics director **Meg Urry**, a former president of the American Astronomical Society and also formerly on the Hubble Space Telescope faculty.

“In my future research, I want to find the missing piece of this puzzle: ‘How did these black holes grow so fast and how did they shape the universe we see now?’ I am beyond thrilled to start working on this project at Yale under the supervision of one of the pioneers of this field, Dr. Meg Urry. I will also proudly carry with me the name of Clemson University,” Marcotulli said.

College of Science News, March 31, 2021

Alumnus Fondly Remembers Malcolm Skove

Dear Dr. Brittain,

When I read of the passing of Malcolm Skove, I could not help but feel a great sense of loss. He was my academic advisor when I entered graduate school, and he always was there when I was in need. He stood by me when I caught some football players cheating on a final exam. Even though he was not my research advisor, he was always available for consultation when I encountered difficulties in the lab.

He taught my first graduate class, Classical Mechanics. He felt that Goldstein’s problems were not challenging enough (I disagreed), and assigned problems from the Cambridge Tri-Post Exams. He would examine our homework in great detail and explain the hidden ramifications of our solutions. I have carried these lessons throughout my teaching career. We also played a lot of football, volleyball, and baseball (drank a lot of beer). I felt he thought of us lowly grad students as colleagues.

*I think fondly of **Malcolm, Will Graben, Ed Gettys, Fred Keller, Henry Vogel, Dr. Huff**, and all the other faculty. Any success I have had in physics I owe to them and I am so very grateful.*

Yours truly,
Dr. Robert Marchini,
Professor of Physics, Emeritus
The University of Memphis

Governor Honors Clemson Faculty for Research Impact



South Carolina Governor Henry McMaster presents Governor's Young Scientist Award for Excellence in Scientific Research to Marco Ajello.

Gov. Henry McMaster has recognized two Clemson University faculty members for their contributions to scientific discovery, education and public service.

Tanju Karanfil, vice president for research and professor of Environmental Engineering and Earth Sciences, has received the 2021 Governor's Award for Excellence in Scientific Research, and **Marco Ajello**, associate professor in the Department of Physics and Astronomy, received the 2021 Governor's Young Scientist Award for Excellence in Scientific Research.

Ajello is an astrophysicist whose research has led to breakthroughs in scientific understanding of the evolution of super-

massive black holes and unraveled some of our universe's mysteries. His research interests include high-energy astrophysics, cosmology and particle astrophysics. He has led an international research team that measured all the starlight ever produced throughout the observable universe's history. Astrophysicists believe that our 13.7-billion-year-old universe began forming the first stars when it was just a few hundred million years old. There are now about two trillion galaxies and a trillion-trillion stars.

Ajello was also part of a research team that devised a new measurement of the Hubble Constant, the unit of measure used to describe the rate of expansion of the universe, and another that captured the first photographic proof that merging galaxies can produce jets of charged particles that travel at nearly the speed of light.

"This is one of the most significant events of my career. I'm truly humbled and honored to receive the Governor's Young Scientist Award for Excellence in Scientific Research."

Ajello has received more than \$2.9 million in research funding since he joined the Clemson faculty in 2014. He has mentored more than twenty-five postdoctoral researchers and students, including graduate student **Lea Marcotulli**, who recently received a prestigious NASA Hubble Fellowship, a first at Clemson. Moreover, Ajello has co-authored 323 peer-reviewed articles during his career. He has won several awards, including the College of Science's Rising Star in Discovery Award for excellence in forefront research and the University Research, Scholarship and Artistic Achievement Award for authoring a paper that has received more than 1,000 citations.

He was part of two research teams that received the Bruno Rossi Prize of the American Astronomical Society for significant contributions to high-energy astrophysics. Ajello is also a recipient of the Otto Hahn Medal, an award given by the Max Planck Society in Germany to junior researchers for outstanding scientific achievement.

Governor's Awards are jointly sponsored by the Governor's Office and the South Carolina Academy of Sciences.

Clemson Researchers' Breakthrough in Solar Cells Material Featured in *Nature Communications*

By using laser spectroscopy in a photophysics experiment, Clemson University researchers have broken new ground that could result in faster and cheaper energy to power electronics.

This novel approach, using solution-processed perovskite, is intended to revolutionize a variety of everyday objects such as solar cells, LEDs, photodetectors for smart phones and computer chips. Solution-processed perovskite are the next generation materials for solar cell panels on rooftops, X-ray detectors for medical diagnosis, and LEDs for daily-life lighting.

“Perovskite materials are designed for optical applications such as solar cells and LEDs,” said **Kanishka Kobbekaduwa**, graduate student and first author of the research article.

“It is important because it is much easier to synthesize compared to current silicon-based solar cells. This can be done by solution processing – whereas in silicon, you have to have different methods that are more expensive and time-consuming.”

The research team included a pair of graduate students and one undergraduate student who are mentored by **Jianbo Gao**, group leader of Ultrafast Photophysics of Quantum Devices (UPQD) group in the College of Science’s Department of Physics and Astronomy. The collaborative research was published March 12 in the high-impact journal *Nature Communications*. The article is titled “*In-situ* Observation of Trapped Carriers in Organic Metal Halide Perovskite Films with Ultra-fast Temporal and Ultra-high Energetic Resolutions.” The principal investigator was Gao, who is an assistant professor of condensed matter physics. The co-authors included graduate students **Kanishka Kobbekaduwa** (first author) and **Pan Adhikari** of the UPQD group, as well as undergraduate **Lawrence Coleman**, a senior in the physics department. Other authors from Clemson were **Apparao Rao**, the R.A. Bowen Professor of Physics, and **Exian Liu**, a visiting student from China.

The unique method used by Gao’s team – employing ultrafast photocurrent spectroscopy – allowed for a much higher time resolution than most methods, in order to define the physics of the trapped carriers. Here, the effort is measured in picoseconds, which are one trillionth of a second.

“We make devices using this (perovskite) material and we use a laser to shine light on it and excite the electrons within the material,” Kobbekaduwa said. “And then by using an external electric field, we generate a photocurrent. By measuring that photocurrent, we can actually tell people the characteristics of this material. In our case, we defined the trapped states, which are defects in the material that will affect the current that we get.”

Jianbo Gao is group leader of the physics department’s Ultrafast Photophysics of Quantum Devices group.



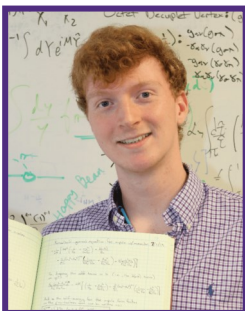
From left, Pan Adhikari, Lawrence Coleman and Kanishka Kobbekaduwa align the ultrafast laser in the UPQD lab.

Once the physics are defined, researchers can identify the defects – which ultimately create inefficiency in the materials. When the defects are reduced or passivated, this can result in increased efficiency, which is critical for solar cells and other devices.

As materials are created through solution processes such as spin coating or inkjet printing, the likelihood of introducing defects increases. These low temperature processes are cheaper than ultra-high temperature methods that result in a pure material. But the tradeoff is more defects in the material. Striking a balance between the two techniques can mean higher-quality and more efficient devices at lower costs. The substrate samples were tested by shooting a laser at the material to determine how the signal propagates through it. Using a laser to illuminate the samples and collect the current made the work possible and differentiated it from other experiments that do not employ the use of an electric field. That transport and the effect of material defects upon it can impact the performance of those materials and the devices in which they are used. It is all part of the important discoveries that students are making under the guidance of their mentor, creating ripples that will lead to the next great breakthrough.

“The students are not only learning; they are actually doing the work,” Gao said. “I am fortunate to have talented students who – when inspired by challenges and ideas – will become influential researchers. This is all part of the important discoveries that students are making under the guidance of their mentors, creating ripples that will lead to the next great breakthrough. We are also very grateful for the strong collaborations with **Shreetu Shrestha** and **Wanyi Nie**, who are top materials scientists from Los Alamos National Laboratory.”

Adapted from Clemson College of Science News, March 12, 2021



Marston Copeland will pursue Ph.D. with NSF Fellowship.

Marston Copeland Awarded NSF Graduate Research Fellowship

Paul “Marston” Copeland, an Honors College senior majoring in physics, will pursue a Ph.D. at Duke University studying theoretical nuclear and particle physics. He is also a 2020 Goldwater Scholar and will graduate with Departmental and General Honors from the Clemson University Honors College.

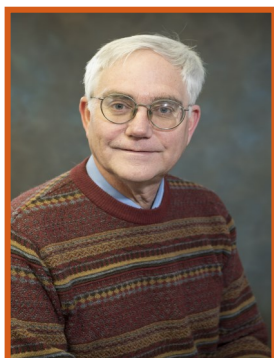
Copeland is interested in researching problems in quantum chromodynamics (the theory of the strong force that holds protons and neutrons together) and

using effective field theories to frame the problems in ways that make them easier to solve.

Copeland has worked with **Joan Marler**, assistant professor of physics and astronomy, at Clemson University for a year, researching experimental atomic physics. He’s also been researching theoretical nuclear physics with **Wally Melnitchouk** of the Jefferson Lab and **Chuang Ji** from North Carolina State University for the past two years through the Jefferson Lab REU and SULI programs. He was selected for the L.D. Huff Junior Award for outstanding junior in physics, nominated for the Outstanding Junior in Science Award, and nominated for the Outstanding Senior in Science Award.

Adapted from College of Science News, April 5, 2021

Alumni Award for Outstanding Achievements in Research Given to Bradley Meyer



Bradley S. Meyer

Twenty-three faculty, staff members and students have been named recipients of the University's 2021 spring awards for teaching, support for student success, mentoring and research.

The recipients were honored at an invitation-only ceremony at the Madren Center's outdoor venue, the Owen Pavilion, Monday, May 3, along with the 2020 spring award winners whose ceremony was canceled due to the pandemic. Attendance at this year's event followed COVID-19 protocols and attendance was limited due to physical distancing requirements.

New in 2021 are awards established by **Provost Bob Jones**.

"Clemson's hallmark is excellence in teaching and learning," said **Provost Bob Jones**. "We are fortunate to have many outstanding instructors, some who are among the best in the nation. This program recognizes these superstars and prepares their dossier for nomination to national awards."

Bradley S. Meyer, professor of physics and astronomy, specializing in nuclear astrophysics, was recognized for his fundamental contributions to our understanding about how stars and the early universe produced the chemical elements. Since the early 1990s, he has also been particularly interested in the implications of nucleosynthesis and galactic chemical evolution for cosmo-chemistry.

Adapted from the Office of the Provost News, April 28, 2021

Chad Sosolik Honored with the George B. Pegram Award

Dr. Chad Sosolik has received the George B. Pegram Award. This honor, first bestowed in 1971, was created by the Southeastern Section of the American Physical Society to honor "Excellence in Physics Education in the Southeast." The award is named for **George Braxton Pegram**, a native of Durham and a graduate of Duke University who was, for many years, chairman of the Department of Physics and Dean of the Graduate School at Columbia University. While he was treasurer of the American Physical Society, Dr. Pegram played an important role in the formation of the Southeastern Section of the American Physical Society. The award recognizes physics educators

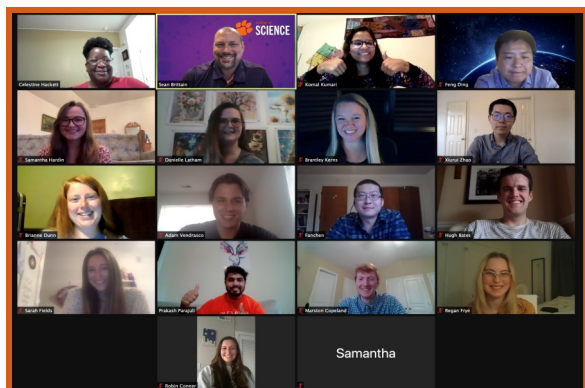


Chad Sosolik garners
Pegram Award.

who have demonstrated outstanding ability in undergraduate education in at least one of the following ways: a) producing a number of majors who have continued in a career in physics; (b) by authoring an undergraduate physics textbook which has received national recognition for its excellent quality; (c) by having an outstanding record of service in teaching as determined by the physics faculties at his own and other institutions; or, by (d) having an outstanding record of service to physics education in the Southeast. Please join the department in congratulating Dr. Sosolik on this award.

Prizes & Awards - Unit - SESAPS

Annual Student Awards



This past year presented exceptional challenges for everyone, due to the Covid pandemic. Nonetheless, Clemson's fantastic physics and astronomy students persisted with their research and excellent work.

On April 23, 2021, an award ceremony was held on Zoom for the 2020 and 2021 graduate and undergraduate student awards.

The awards and recipients are as follow:

L.D. Huff Sophomore Award
Sarah Fields, 2020
Samantha Hardin, 2020
Regan Frye, 2021

L.D. Huff Junior Award
Marston Copeland, 2020
Samantha Hardin, 2021

National Science Foundation F-MC3PA Pedagogical Research Award
Yamei Liu and **Samalka Anandagoda**, 2020**

Samantha Erin Cawthorne Award
Brantley Kerns, 2020
Charles Chronister, 2021
Robin Conner, 2021

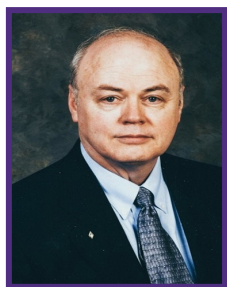
Graduate Research Award
Fanchen Meng, 2020
Xiu Rui Zhao, 2021
Komal Kumari, 2021
Prakash Parajuli, 2021

**This award of \$500 was paid for by the Center for Occupational Research to pilot instructors of the "Measuring Collaboration in Complex Computerized Performance Assessments (MC3PA - 6525)."

Graduate Teaching Award
Hugh Bates, 2020
Danielle Latham, 2021

SPS Awards
Marston Copeland, 2021
Adam Vendrasco, 2021

Remembering Daniel Welch



Dr. Daniel Wayne Welch (Ph.D., physics, Clemson, 1977) died on November 6, 2020, at his home in Spartanburg, South Carolina. He was survived by his wife **Shannon**, their three grown children, and their families. Born in Baton Rouge, he got his bachelor's at the University of Southwest Louisiana, and then joined the graduate program at Clemson.

After obtaining his Ph.D. from Clemson, Dan joined the faculty at Wofford College where he taught physics for forty-two years and was still teaching when he passed.

passed. Dan visited Clemson frequently where he collaborated with **Dr. Murray Daw** and also where he took a sabbatical last fall. For several years, Dan served as chairman of the physics department at Wofford. He was also active as a Certified Member of the Institute for Advanced Physics, through which he was very involved in the development of improved physics understanding and curriculum.

Physics Professor Rao Named Fellow of Prestigious Materials Research Society

Clemson University Department of Physics and Astronomy faculty member **Apparao Rao** was selected as a 2020 Fellow of the Materials Research Society (MRS) for developing liquid-based scalable synthesis methods to manufacture carbon nanotubes – a class of nanomaterials used in numerous applications, including energy storage, medicine, electronics, and composites.



Apparao Rao has been named a Fellow of the prestigious Materials Research Society for his research on nanotubes.

MRS confers this prestigious honor on only 0.02 percent of its members each year for lifetime recognition of their research, leadership or service to the materials field. Rao is the first faculty member at Clemson and in the entire State of South Carolina to earn Fellow status in this society.

“In the past five years, on average, MRS elected only eighteen members across the globe as Fellows each year, so when I look at all the previous MRS Fellows, I feel very humbled to be in their company,” said Rao, who holds an R. A. Bowen Endowed Professorship in the College of Science and is the founding director of the Clemson Nanomaterials Institute. “From my own experience at Clemson University, if you build the right team with highly motivated students, you can accomplish world-class research.”

Specifically, Rao said, he’s grateful for the support of several people who helped him launch his Clemson career, including his wife **Vasantha Rao**, former physics department head **Peter Barnes**, and former VP for research **Larry Dooley**. Above all, Rao acknowledges the seed funding he received through the R.A. Bowen Endowed Professorship to explore new vistas in nanomaterials research.

Rao joined the Clemson physics faculty in 2000. Previously, he conducted research as a post-doctoral researcher at the Massachusetts Institute of Technology under the guidance of 2009 MRS Fellow, Kavli Laureate and MIT Professor **Mildred Dresselhaus**, known as the “Queen of Carbon” science for her pioneering research in low dimensional materials, including carbon nanotubes.

“Dr. Rao continues to elevate Clemson’s national prominence in scientific discovery and innovation and this very special recognition as an MRS elected Fellow is one more nod to some of the pioneering work our great faculty are leading at Clemson,” said **Cynthia Y. Young**, College of Science dean. “I congratulate Professor Rao, and I thank the late Robert Adger Bowen for his transformational gift that established endowed professorships in Science – like the professorship held by Rao.”

According to **Sean Brittain**, the chair of Clemson’s Department of Physics and Astronomy, Rao is not only a pioneering researcher, but his work has helped elucidate the fundamental properties of carbon systems, and he has used that insight for innovative applications that benefit humanity.

“He has launched the careers of countless graduate students who have taken their education to industry and academia,” Brittain said. “He is also a tireless mentor and advocate for our junior faculty, who are now well-established scholars in their own right.”

Continued on next page

During his twenty-year career at Clemson, Rao has pioneered the use of liquid-injection chemical vapor deposition as a means to making nanomaterials like carbon nanotubes. In the early 2000s, he and his student **Jay Gaillard** (Ph.D. 2006) devised a one-step synthesis method that vastly improved the manufacturing process. According to Rao, the previous growth methods involved two steps: depositing a catalyst particle on a substrate surface followed by decomposing a hydrocarbon gas.

“Industry doesn’t like a multi-step process because it could be expensive and time consuming,” Rao explained. “What we did was put the catalyst in our liquid mix and then injected the mix onto a substrate that was heated inside a furnace. By controlling the injection rates and the growth conditions, we grew very high-purity nanotubes on substrates such as quartz and silicon.”

Four years later in 2004, Rao’s team experimented with different catalysts in the liquid-injection method to make carbon nanotubes grow into Y-shaped or branched nanotubes. Along with his faculty colleague **Prabhakar Bandaru** from the University of California at San Diego, they demonstrated that the Y-shaped nanotubes could function as nanoscale transistors.

“Using the liquid-injection method, my team also developed methods to introduce defects, such as dopants or missing atoms in the carbon lattice in a controlled fashion,” said Rao, which enabled the preparation of *p*-type and *n*-type nanotubes.

Collectively, the liquid-injection method helped establish two paradigms: “shape defines function,” namely that nanotubes function as transistors when Y-shaped, and they function as shock absorbers when coiled; and proper defects enable better material performance, which was presented at a local TED event.

Rao’s full MRS Fellow citation reads: “For pioneering liquid-based scalable synthetic methods to manufacture carbon nanotubes with controlled morphologies and dopant concentrations, and for using Raman spectroscopy to elucidate their structure – applications and fundamental properties.”

In addition to this latest honor, Rao is a Fellow of National Academy of Inventors, the American Physical Society and the American Association for the Advancement of Science.

Meet Our New Faculty Hires

Over the past year, the Department of Physics and Astronomy has hired four faculty members. Please join the Department in welcoming them to the University and to the Clemson community.



Jeffrey Fung’s research interests are disk dynamics, disk-planet interaction, planet formation, numerical methods. Fung earned his Ph.D. in astronomy and astrophysics at the University of Toronto, after receiving his B.S. in physics and its applications at the same institution in 2009. Prior to joining to the faculty of Clemson, he was a member of the Institute for Advanced Study at Princeton University.

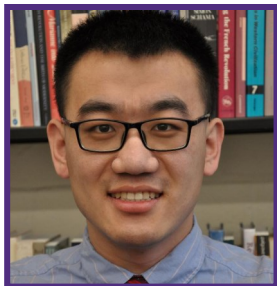
Before his time at Princeton, Fung was a Teaching Experience Instructor, NASA Sagan Fellow, as well as a postdoctoral fellow at the University of California at Berkeley.

Kasra Sardashti's research interests are in the area of interface engineering for advanced solid-state devices for applications in energy generation and energy-efficient computation. In recent years, he has been focused on discovering innovative materials solutions for thin-film solar cells and superconducting qubit devices.



Before joining Clemson's faculty, he was a research scientist at the Center for Quantum Phenomena, New York University, which he began in 2018. Previously, was a postdoctoral research associate in the Department of Mechanical Engineering and Materials Science at Duke University.

Sardashti received his Bachelor of Science in Materials Engineering in 2010 from Tehran Polytechnic, Iran, his Master of Science in advanced material and processes from the Friedrich Alexander University of Erlangen - Nuremberg, Germany in 2012, and his Ph.D. in materials science in 2016 from the University of California at San Diego.



Yao Wang joined the faculty in 2020. His interests are correlated electrons: quantum many-body systems, electron-boson coupling, quantum simulators; nonequilibrium physics: time-domain theory and numerical techniques, pump-probe experiments; spectroscopies: single-particle spectra (ARPES), collective excitations (INS, IXS, Raman, optics), resonant spectra (RIXS), time-resolved spectroscopies (trARPES, trRaman, trRIXS); and, high-performance computing: advanced many-body algorithms and massively parallel computing education.

In 2017, Wang graduated with a Ph.D. in applied physics from Stanford University, having earned an undergraduate degree in 2011 in applied physics from the University of Science and Technology of China. Subsequently, he held was a research assistant at Stanford and held a postdoctoral fellowship from 2017 to 2020 at Harvard, from which he joined Clemson.

Jonathan Zrake joined the faculty as an assistant professor of physics in 2020.

Zrake's group works on topics in high energy and multi-messenger astrophysics, using high-performance, state-of-the-art computing. His interests include binary neutron star mergers, gamma-ray bursts, pulsar wind nebulae, AGN jets, binary black hole accretion, turbulence, and magnetic reconnection.



From 2017 to 2020 Zrake was a research scientist at Columbia University. From 2013 to 2017, he was a Kavli Fellow at Stanford University. He completed his Ph.D. at New York University in 2013.

****The Physics and Astronomy Department office has now resumed normal business operations. ****

The Clemson University Physics and
Astronomy Newsletter

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Department News



Physics and Astronomy has just hired a new administrative assistant, **Kim Webb**. Kim will be assuming the front desk responsibilities and will be the new face of the department.



Retired department chair and faculty member **Terry Tritt** has been accepted into the prestigious European Union Academy of Sciences.



Jian He was promoted to full professor; **Joan Marler** and **Ramakrishna Podila** were both granted tenure and promoted to be associate professors. Podila has also been recognized with the Rising Star in Discovery Award for 2021 and has been extremely productive working on projects spanning battery research to wireless sensors to nano-bio.



Daniel Thompson along with the other building managers in the college has been recognized with the Outstanding Team Award for 2021. Daniel has done excellent work helping us to adapt to the challenges posed by the COVID-19 pandemic.

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