



ECE News

Spring 2021

Department of Electrical and Computer Engineering
Hajim School of Engineering & Applied Sciences
University of Rochester



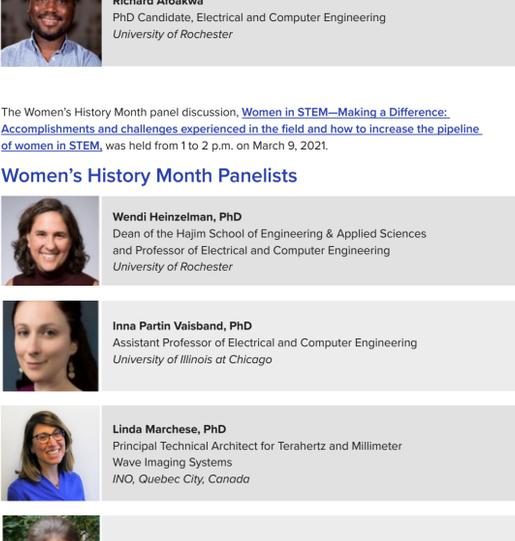
Zoom meeting of Strain-driven phase transitions in 2D van der Waals based devices

Welcome!

Welcome to the first issue of the Department of Electrical and Computer Engineering's electronic newsletter. This publication will be distributed by email each semester to share the latest from the department. Keep reading for information about upcoming and recent events, faculty news, graduate and undergraduate updates, and more.

Spring Events

- View a list of upcoming ECE events:**
hajim.rochester.edu/ece/news-events/events/index.html
- Watch recordings of past ECE events:**
hajim.rochester.edu/ece/news-events/events/recorded/index.html
- View a list of upcoming MS and PhD defenses:**
hajim.rochester.edu/ece/news-events/events/ms-phd_defenses/index.html



Roman Sobolewski, a professor of electrical and computer engineering, of physics, and of materials science as well as a senior scientist at the Laboratory for Laser Energetics

ECE Seminar Series

Terahertz Photonics
Roman Sobolewski, University of Rochester
Wednesday, March 10, 2021

Towards an Intelligence Architecture for Human-Robot Teaming
Rohan Paul, Indian Institute of Technology Delhi, India
Wednesday, March 17, 2021

Controlling Laser Beams for Grand Challenge Applications
D. H. Froula, Physics Department & Laboratory for Laser Energetics, University of Rochester
Wednesday, March 24, 2021

Research Challenges in High Performance Integrated Systems
Eby Friedman, Department of Electrical and Computer Engineering, University of Rochester
Wednesday, March 31, 2021
Noon–1 p.m.
<https://rochester.zoom.us/j/92474082834>, Passcode: 066310

Superconducting single-photon detector
Robert Hadfield, University of Glasgow, United Kingdom
Wednesday, April 7, 2021
Noon–1 p.m.
<https://rochester.zoom.us/j/92474082834>, Passcode: 066310

Talk Title To Be Announced
Val Zwillier, KTH Royal Institute of Technology, Stockholm
Wednesday April 14, 2021
Noon–1 p.m.
<https://rochester.zoom.us/j/92474082834>, Passcode: 066310

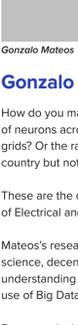
Planar nanodiodes for THz detection and emission
Javier Mateos, University of Salamanca, Spain
Wednesday, April 28, 2021
Noon–1 p.m.
<https://rochester.zoom.us/j/92474082834>, Passcode: 066310

Recent Events of Note

The Department of Electrical and Computer Engineering held two special events this spring: Zoom panel discussions for Black History Month and Women's History Month.

The hour-long Black History Month panel discussion, [Experiences and Accomplishments of African Americans in Academia, Industry, and Research](#), was held on Friday, February 26, 2021.

Black History Month Panelists

 **Marvin Doyley, PhD**
Chair of the Department of Electrical and Computer Engineering and Professor of Electrical and Computer Engineering, of Biomedical Engineering, and of Imaging Sciences
University of Rochester

 **Kelly Nash, PhD**
Professor and Associate Dean for Faculty Affairs
The University of Texas at San Antonio

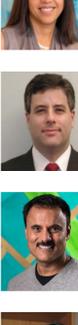
 **Cynthia Y. Lester, PhD**
Associate Dean of Division of Math, Computer Science and of the Clarkston Campus
Georgia State University

 **Francis Smith, PhD '19**
Hardware Engineer
Cisco Systems Inc.

 **Richard Afoakwa**
PhD Candidate, Electrical and Computer Engineering
University of Rochester

The Women's History Month panel discussion, [Women in STEM—Making a Difference: Accomplishments and challenges experienced in the field and how to increase the pipeline of women in STEM](#), was held from 1 to 2 p.m. on March 9, 2021.

Women's History Month Panelists

 **Wendi Heinzelman, PhD**
Dean of the Hajim School of Engineering & Applied Sciences and Professor of Electrical and Computer Engineering
University of Rochester

 **Inna Partin Vaisband, PhD**
Assistant Professor of Electrical and Computer Engineering
University of Illinois at Chicago

 **Linda Marchese, PhD**
Principal Technical Architect for Terahertz and Millimeter Wave Imaging Systems
INO, Quebec City, Canada

 Sarah Smith, PhD
Assistant Professor of Electrical and Computer Engineering
University of Rochester

 Narges Mohammadi
Doctoral Student in Electrical and Computer Engineering
University of Rochester

Open Sessions

Open Sessions are monthly live sessions held at the Gavett Recording Studio on River Campus. All open sessions are free and are run by students in the University of Rochester Audio and Music Engineering Program.

[View upcoming sessions and listen to past sessions: uropensessions.com](http://uropensessions.com)

Faculty News

Mark Bocko

Marvin Doyley

Change in Department Leadership

For 14 years, deans of engineering have benefited from Mark Bocko's leadership as chair of the Department of Electrical and Computer Engineering, from 2004–10 and again since 2013. Bocko, the Distinguished Professor of Electrical and Computer Engineering, was the driving force behind one of our most popular undergraduate programs—audio and music engineering—which was launched in 2013 and gives students the skills they need to enter the rapidly changing field of audio and sound engineering. The University's \$3 million investment in a state-of-the-art recording studio, control room, mixing rooms, and sound design lab was a major milestone for the program. Bocko will continue to direct that program, as well as the Center for Emerging and Innovative Sciences (CEIS), enabling him to continue to forge links between academic researchers and local companies and to advocate for developing the Rochester region as a center for light- and sound-based technologies. Mark has been an outstanding leader, and we are glad that we will continue to benefit from his vision and ideas.

Marvin Doyley, who will succeed Bocko, has already been serving as associate chair and last year was one of 20 faculty members nationwide who were selected as the first cohort of the [iAspire Leadership Academy](#), a program aimed at helping STEM faculty from underrepresented backgrounds ascend to leadership roles at colleges and universities. His project for the program involved growing a pipeline to help diversify graduate students and faculty in the department. Doyley, recently elected a fellow of the American Institute for Medical and Biomedical Engineering (AIMBE), "is a great faculty colleague, and over the years he has contributed tremendously to ECE's research profile and teaching mission," says Bocko. "He clearly already possesses the skills and energy to be a wonderful leader for our department and the University." We will certainly benefit from Doyley's leadership!

As reported in [Hajim Highlights, June 2020](#)

Kevin Parker

Kevin Parker Collaborating on an NIH Grant for Optical Coherence Tomography (OCT)

Kevin Parker, the William F. May Professor of Engineering and dean emeritus of engineering and applied sciences; Thomas Nedergaard, professor of neurology and neuroscience; and Jannick Rolland, the Brian J. Thompson Professor of Optical Engineering and director of the Center for Freeform Optics (also affiliated with the Materials Science program), are collaborating on a \$421,880 [National Institutes of Health \(NIH\) grant](#). They will use optical coherence tomography (OCT) elastography, a high-resolution imaging modality, to perform biomechanical measurements in mice, showing the variations in the softness and stiffness of brain tissue over time that are associated with aging and neurodegenerative diseases such as Alzheimer's disease.

All three of these researchers are pioneers in their respective fields. Parker and his colleagues created the field of elastography, initially using ultrasound, to image the elastic properties of tissues. Rolland's lab is not only at the forefront of freeform optics but invented its own class of Gabor-domain OCT. And Nedergaard documented, for the first time, the glial waste removal system of the brain and how obstructions to that process may be linked to Alzheimer's. They are joined by Gary Ge, who is an MD/PhD student and will incorporate this work into his thesis.

The thickness of the human skull and the large size of the human brain have made it difficult to image changes in the mechanical properties of brain tissue associated with aging and neurodegenerative diseases in live human patients. That will not be a problem with the much smaller mouse models of brains in normal, aging, and disease states in Nedergaard's lab. The detailed images that can be obtained with OCT will help inform the basic science underlying these changes in brain tissue, create useful biomarkers, and guide future clinical measurements in humans.

Though OCT imaging of the brain in the near future won't be routine for humans, Parker says the insights gained from imaging mouse models can help guide clinical research being done here and elsewhere on developing other emerging modalities—such as magnetic resonance elastography—for detecting and tracking these disorders in the human brain.

As reported in [Hajim Highlights, January 2021](#)

Marvin Doyley

Marvin Doyley Puts Priority on Addressing Underrepresentation

Marvin Doyley is accustomed to attending major conferences of electrical engineers where he is one of only a handful of black delegates.

"It doesn't bother me now as much as it did before," Doyley says. "Now, I am a senior member, I have worked my way up, people know me, we have common experiences to talk about. But I'll be looking at someone else who is a minority just starting to come up who will be standing at the back, hesitant to speak or ask questions."

The professor of electrical and computer engineering at the Hajim School is now in a position to help address the underrepresentation of minorities and women in STEM fields.

This past year he was one of 20 faculty members nationwide who participated in the first cohort of the [iAspire Leadership Academy](#), a program aimed at helping STEM faculty from underrepresented backgrounds ascend to leadership roles at colleges and universities.

This past July, Doyley did just that when he became chair of the Department of Electrical and Computer Engineering.

As part of his iAspire training, Doyley explored ways to grow a pipeline to help diversify graduate students and faculty in his department. He has now applied for National Science Foundation funding for an REU (research experience for undergraduates) program that would bring underrepresented minority and women students from other colleges and universities to the department to do mentored summer research projects. The hope is they would then return to the department to do graduate work and perhaps even stay on as faculty after that. And despite the distractions of leading a department amid a pandemic, fostering diversity and inclusion is still very much on Doyley's radar.

Read more: rochester.edu/newscenter/marvin-doyley-selected-for-first-cohort-of-national-stem-leadership-program-394002/

Gonzalo Mateos

Gonzalo Mateos 'Connects the Dots' of Complex Networks

How do you make sense of the millions, even billions, of data points that represent the interactions of neurons across the human brain? Or the interconnections of our country's vast network of power grids? Or the rates of COVID-19 infections and hospitalizations as they surge in some parts of the country but not others?

These are the questions Associate Professor Gonzalo Mateos and his lab explore in the Department of Electrical and Computer Engineering at the Hajim School.

Mateos's research interests lie in the areas of statistical learning from Big Data, network science, decentralized optimization, and graph signal processing. Applications include a better understanding of the Internet, social networks, power grids, the human brain, and a more effective use of Big Data analytics.

For example, in 2016 Mateos received pilot funding from the University's Neurogen Institute for Data Science in collaboration with Alex Paciorkowski, an assistant professor of geology, to develop software to help predict which treatments are likely to have the best outcomes for epilepsy patients.

"I look at fundamental problems at the intersection of signal information processing and machine learning for networked systems," Mateos says. "We are seeing this huge revolution in artificial intelligence, and data is becoming even more complex, unstructured, and multimodal. So trying to crack problems in this domain is going to have a huge impact in decades to come in terms of bettering society, the economy, and the way we deliver health care."

Read more: hajim.rochester.edu/about/spotlights/mateos.html

Alumni News

Juvenal Ormachea

Juvenal Ormachea '16 MS, '19 PhD, Named Top '35 Innovator Under 35' for Latin America

Hajim Highlights reports that Juvenal Ormachea '16 MS, '19 PhD, a postdoctoral researcher in Kevin Parker's lab in electrical and computer engineering, has been selected by MIT Technology Review for its list of top "35 innovators under 35" for Latin America in December 2020. Juvenal has created a noninvasive method to detect cancer and liver diseases such as cirrhosis based on medical ultrasound images generated using ultrasound scanners.

Graduate Student News

Raiyan Baten, ECE PhD Student, Has His Research Featured

Congratulations to ECE PhD student Raiyan Baten, who works with Professor Ehsan Hoque in the computer science human-computer interaction lab, for having his research highlighted on the University's Newscenter and in the *Journal of Royal Society Interface*.

Undergraduate Student News

Yujin Nakamoto Awarded Robert L. Wells Prize

ECE's Yujin Nakamoto is one of three outstanding students announced as this year's recipients of the Robert L. Wells Prize, awarded to Hajim School students who also excel in the humanities.

The seniors, Sophia Guarnieri of biomedical engineering, Yujin Nakamoto of electrical and computer engineering, and math, and Jayin Zhang of mechanical engineering, each is also pursuing another major or minor. Nakamoto, for example, is also majoring in classical Greek. Zhang is completing minors in physics and in art history, and Guarnieri is completing a minor in Spanish. Winners are chosen based on highest GPAs at the end of their junior year.

All three students have taken full advantage of our University's open curriculum and status as a top research institution. They are not only pursuing rigorous engineering degrees but also gaining hands-on lab experience doing cutting-edge research. We congratulate them for also putting a priority on the humanities, which helps them become better-rounded engineers. Well done, Sophia, Yujin, and Jayin! Read more about their achievements [here](#).

Meet Our Advisory Board

Learn more about our Advisory Board, including full biographies of each member, at hajim.rochester.edu/ece/people/advisory.html.

 David Albonesi
Professor, University of Rochester and Cornell University
Term 2020–2023

 David Chen
Cofounding Chairman, AngelVest Group
Term 2020–2023

 Tanzeem Choudhury
Professor, Cornell University; Cofounder, HealthRhythms, Inc.
Term 2020–2023

 Michael Fisher
Chief Intellectual Property Counsel, KaVo Kerr Group
Term 2020–2023

 T. S. Khurana
Vice President of Global Sourcing and Operations Engineering, Facebook
Term 2020–2023

 Sanghamithra Korukonda
Senior Scientist, Nanosting Technologies
Term 2020–2023

 Linda Marchese
INO and Principal Technical Architect, Terahertz and Millimeter Wave-Imaging Systems
Term 2020–2023

 Inna Partin-Vaisband
Assistant Professor, University of Illinois at Chicago
Term 2020–2023

 Mario Simpson
PMP, Square Peg Technologies
Term 2020–2023