RIT | College of Science

SUMMER IN REVIEW

Summer 2019

For a while we questioned whether it would ever happen, but eventually the wet, rainy days of spring transformed into the hot, sunny days of summer. The College of Science was vibrant even during these quiet months with COS students gaining valuable research experience through the **Emerson Summer Undergraduate Research Fellowships**, **Fast Forward Summer Research** program, and even a few lucky students from colleges across the country working with RIT faculty in the **Research Experience for Undergraduates (REU)** program.

Construction projects continued throughout the summer to prepare spaces that will keep COS students on the cutting edge of research. We're excited to see the reopening of the Environmental Sciences lab and the Introduction to Biology lab on the A-level of Gosnell Hall. You'll see work continuing throughout the fall semester to renovate the General Biology Lab and to transform the space that was previously a multi-purpose chemistry tutoring/student lounge/research space into a multi-faceted presentation space.

Academic units in the College of Science were pleased to host several outstanding workshops and conferences this summer. The School of Mathematical Sciences hosted local teachers and students at the **Summer Math Institute**, **SMASH Experience for Girls** and the **Summer Math Workshop**, Dr. Jerry Takacs was influential in bringing the **International Symposium on Polymer Surface Modification** to Gosnell Hall, and the Center for Computational Relativity and Gravitation hosted two workshops for astrophysics researchers in June.

Faculty in every academic unit used the pause in the teaching load to prepare journal articles for publication, and grants for funding, and to present findings at conferences. I look forward to sharing the results of these endeavors that took place following commencement in May through August 15 in this and future editions of our newsletter.

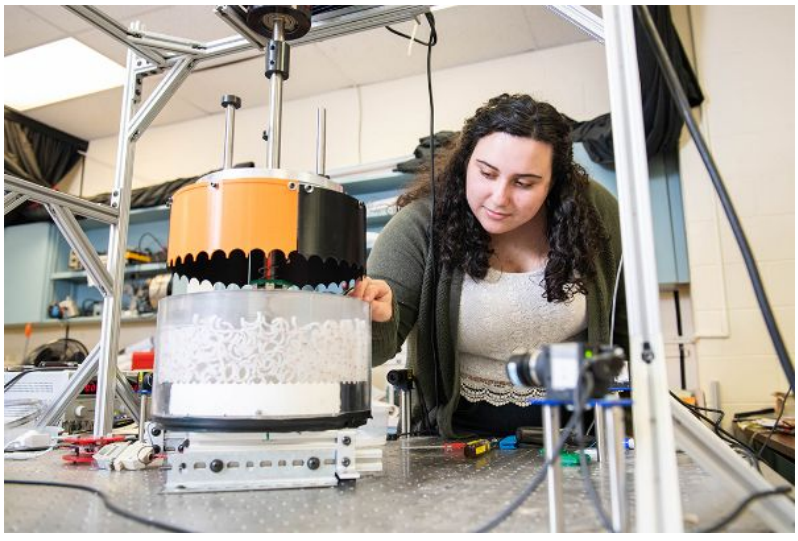
SOPHIA MAGGELAKIS
Dean, RIT College of Science

Student & Alumni News

2019 Distinguished Alumni announced

We are pleased to share that the College of Science Distinguished Alum is **Susan Gordona**, '94 (applied mathematics). The 2019 Distinguished Alumni will be honored on October 18 during the Brick City Weekend.

Read More >



Physics student Elyse Rood poised for career doing problem-solving engineering for medical software

Before Physics undergraduate student **Elyse Rood** started working on her senior physics capstone project, she didn't envision herself working for a

software company. But she developed a knack for coding and experimentation while working on her senior capstone project.

Read More >

RIT alumnus to serve as futures analyst for U.S. Agency for International Development

A Rochester Institute of Technology alumnus earned a prestigious fellowship to use his scientific skills to help shape federal policy. **Brennan Ireland** ’18 Ph.D. (astrophysical sciences and technology) was selected by the American Association for the Advancement of Science for a Science & Technology Fellowship to serve as a futures analyst with the U.S. Agency for International Development.

Read More >

COS students show eighth graders how to have fun with math and science at SMASH

RIT hosted a group of 36 rising eighth grade girls for the **Summer Math Applications in Science with Hands-On (SMASH) Experience for Girls**, a week long course designed to show middle schoolers how fun and rewarding studying science and math can be.

Read More >

Alumni Update: RIT's first genetic counselor empowers women

During a single year, **Jessica Salamone** '99 (biotechnology) will counsel thousands of women on their hereditary cancer risk. She also teaches two genetics courses in RIT's biomedical sciences program and offers guidance to students.

Read More >

COS alumni among USGIF Golden Ticket award winners

The United States Geospatial Intelligence Foundation (USGIF) selected three recent RIT graduates for its Young Professionals Golden Ticket Program. The program provides young professionals the opportunity to receive complimentary GEOINT Foreword and GEOINT 2019 Symposium registration. Recipients from RIT included **Tyler Kuhns** '18 (imaging science), **Poppy Immel** '18 (computational mathematics) and **Geoffrey Sasaki** '18 (photographic sciences).

RIT hosts REU Graduate Study and Research Symposium

RIT offers eight National Science Foundation-funded **Research Experiences for Undergraduate (REUs)** students, four within the College of Science, making it one of the top host sites in the country. The REU students attended a symposium in June to help these students explore the next step in their education through a networking symposium focused on graduate research.

Keynote speaker and RIT Alum **Nathan Reff** ’06 (applied mathematics), ’07 MS (applied and computational mathematics), an associate professor at The College at Brockport, presented “Juggling and Mathematics” following a networking lunch.

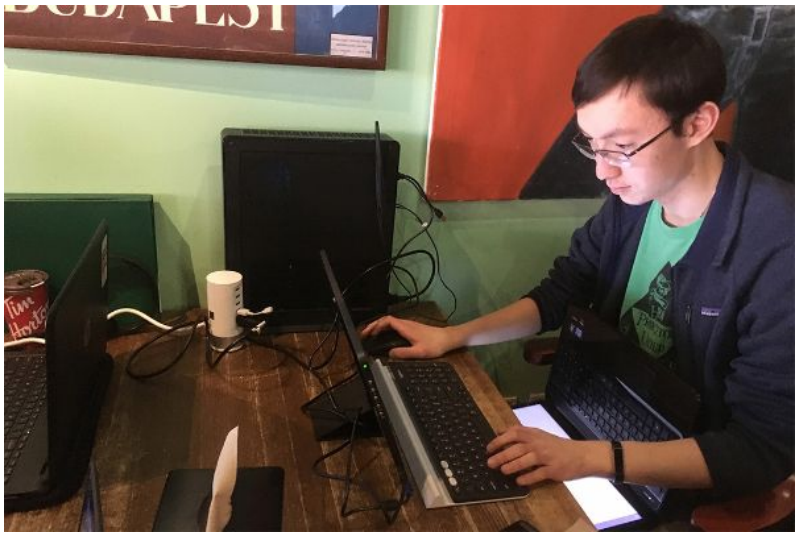
Read More >

RIT undergraduates share cutting-edge research at annual summer symposium

More than 250 student projects, representing all nine colleges, were on display at the 28th annual **Undergraduate Research Symposium** on August 1 at RIT. Research findings were featured in a series of oral and poster presentations throughout the day.

The keynote speaker for the symposium was **Jason Babcock** ’00 (imaging and photographic technology), ’03 (color science), founder of Positive Science, creators of a head-mounted eye-tracking and behavioral analysis system. His company graduated from RIT’s Venture Creations technology business incubator earlier this year.

Read More >



RIT student develops tool to visualize molecular dynamics of proteins in virtual reality

Kyle Diller, a fifth-year computer science student from East Windsor, N.J., developed a plug-in application for the molecular visualization program UCSF ChimeraX as a project for his bioinformatics languages class taught by **Gregory Babbitt**, an associate professor in the Thomas H. Gosnell School of Life Sciences.

Read More >

RIT/NTID awards Dodge Faculty Grant to chemistry instructor

Jennifer Lynn Swartzenberg, adjunct faculty in NTID's science and mathematics department, is the 2019-2020 recipient of the Ronald D. Dodge Memorial Faculty Grant at Rochester Institute of Technology's National Technical Institute for the Deaf to fund her project to produce videos of established and new American Sign Language (ASL) signs for organic chemistry. In addition to the Dodge grant, Swartzenberg was also awarded an RIT Provost's Learning Innovation Exploration Grant for the project.

Read More >

COS students lead Camp Tiger adventures

Several COS students led summer camp programs at Camp Tiger on the RIT campus this July including the Experiments in Science camp pictured above where middle school students observed the density of various liquids and conducted other simple science experiments. Recent physics graduate, **Devon Christman** was the leader of the Dungeons and Dragons camp, highlighted in a video segment on News 8.

Our Stories and News

College mourns loss of a colleague

Words cannot convey the sadness that we feel as we share the news of the loss of our friend and colleague, **Paul Wenger**, associate professor in the School of Mathematical Sciences. Paul passed away on the afternoon of August 8 after a hard and brave fight with incurable cancer. Paul was known in our college for his perseverance, work ethic, wisdom, high standards, integrity, dedication to our students, and his love for mathematics. He was an exceptional colleague, student mentor, and faculty member who will be greatly missed by the many people whose lives he touched. We offer his family our deepest condolences.

CASTLE

A Celebration of CASTLE

RIT's Center for Advancing STEM Teaching, Learning and Evaluation recognized four individuals with the Science and Math Education Research Honor Award for making outstanding contributions to CASTLE during the sixth annual CASTLE Symposium on May 8. Those recognized included **Sam Cammarata**, a fourth-year applied arts and sciences student; **Stacey Davis**, principal lecturer in the Department of Science and Mathematics at NTID; **Michael Eastman**, associate dean for Academic Programs and Continuous Improvement in the College of Engineering Technology; and **Debra Jacobson**, marketing specialist for CASTLE.

COS Academic Advisors enrich the advising community

The College of Science advising team attended the NY Drive-in Conference at Monroe Community College on June 7, hosted by the National Academic Advising Association – NACADA, Rochester Area Colleges Advising – RAC Advising, and MCC's Advisement & Transfer Services. At the conference, COS advisors **Lindsay D'Alleva** and **Lindsay Cohen** presented their accepted conference proposal: "Supporting Anxious Students in a High-Risk Environment." Their presentation was well attended and contributed to the advising field in an impactful manner.

RIT hosts Polymer Surface Modification International Symposium

The 10th International Symposium on Polymer Surface Modification with Relevance to Adhesion was held in Gosnell Hall on June 19-21, 2019. Organized by **Gerald Takacs**, professor in the School of Chemistry & Materials Science, the symposium focused on the technological areas where surface modification is a key technology which allows for the processing and manufacture of products which would otherwise be unobtainable. Two RIT summer research students—**Omran Omar**, a student at the University of Buffalo, and **Reeba Thomas**, a materials science and engineering graduate student—and three COS faculty members, **Matt Miri,** associate professor in the School of Chemistry & Materials Science, **Michael Pierce,** associate professor and director of the materials science and engineering graduate program, and **Gerald Takacs** presented papers at the event.

RIT awarded NSF funding to conceptualize Quantum Photonic Institute

The National Science Foundation awarded Rochester Institute of Technology a grant to conceptualize a new institute that would be at the forefront of quantum science and technology. RIT received $150,000 in funding from the NSF's Quantum Leap Challenge Institutes program to create a plan for an institute that would expand quantum science and technology capabilities through quantum photonic integrated circuits.

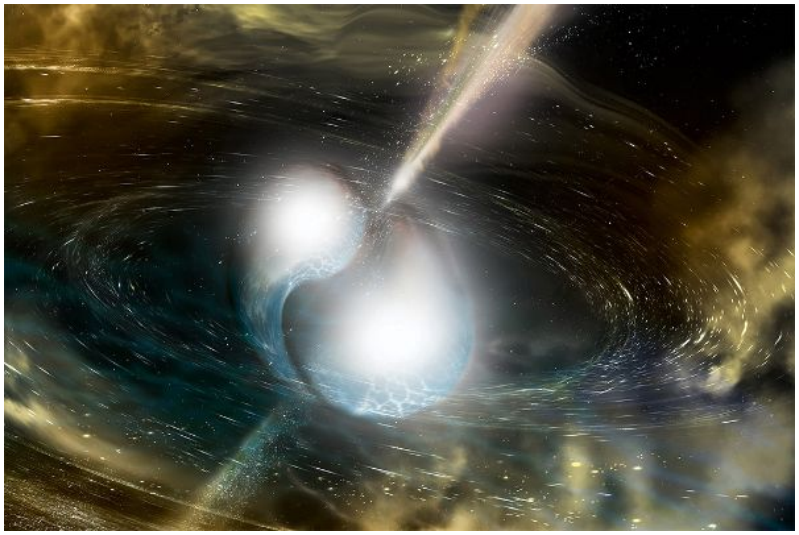
Read More >

Imaging Science professor receives Jefferson

Science Fellowship

Professor **John Kerekes** is one of 11 faculty nationwide to be selected for a 2019-2020 Jefferson Science Fellowship. He will spend the next year advising the U.S. Department of State on issues including its air quality monitoring program and Earth Challenge 2020, the world's largest ever coordinated citizen science campaign.

Read More >



CCRG gathers computational astrophysics experts for workshops in June

The Center for Computational Relativity and Gravitation (CCRG) hosted back to back workshops for an international audience of astrophysics experts in mid-June. The 2019 edition of the North American Einstein Toolkit (NAET) workshop was held at RIT June 17-19. The Theoretical and Computational Astrophysics Networks (TCAN) Workshop was held June 19-21 and funded by NASA.

Read More >

Thirty years of imaging science at RIT

Thirty years after the **Center for Imaging Science** building was dedicated, it is now home to more than 150 students studying imaging science at the undergraduate and graduate level. RIT currently has nearly 100 students

pursuing their Ph.D. in imaging science and awarded 17 imaging science doctoral degrees in 2018-19.

RIT will host a special celebration commemorating the Chester F. Carlson Center for Imaging Science's 30th anniversary during Brick City Weekend.

Read More >

Artificial intelligence and Google Street View could hold the key to stopping invasive plants

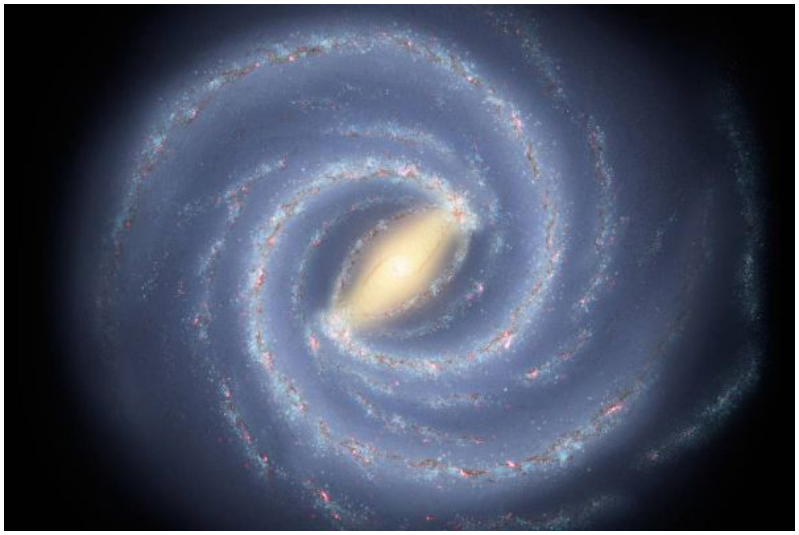
The New York State Department of Environmental Conversation will award two COS faculty a grant to map roadside infestations of five key invasive plant species in the Finger Lakes and Adirondack Park over the next two years.

Read More >

RIT expands genomics research

RIT's genomics research capabilities have evolved significantly over the past year. The university has invested heavily in revamping and equipping its Genomics Research Lab Cluster. A $1.5 million Empire State Development grant RIT received from New York state last fall helped equip the labs. RIT renovated its genomics suite of laboratories and invested in technology such as an Illumina Next Generation Sequencer, which allows students and faculty to sequence the genomes of more complex organisms than before.

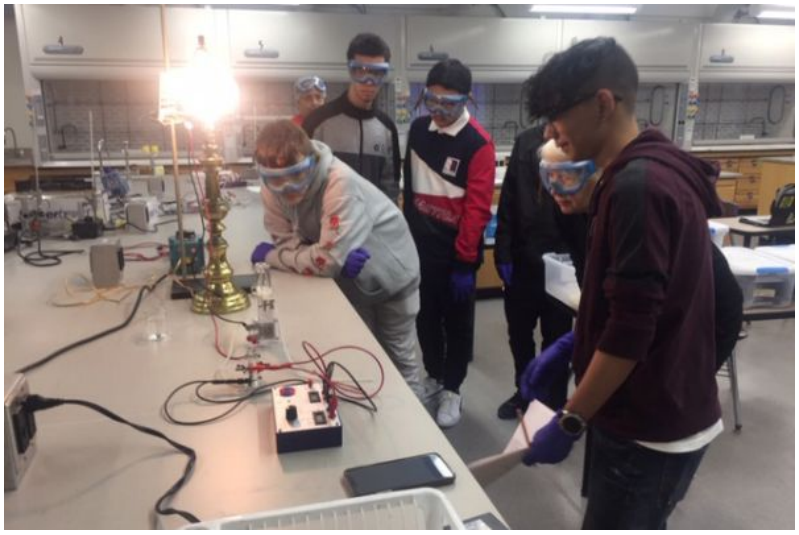
Read More >



New evidence shows crash with Antlia 2 gave the Milky Way the ripples in its outer disc

The newly-discovered dark dwarf galaxy Antlia 2's collision with the Milky Way may be responsible for our galaxy's characteristic ripples in its outer disc, according to a study led by **Sukanya Chakrabarti,** assistant professor in the School of Physics and Astronomy. The Antlia 2 dwarf galaxy was discovered from the second data release of the European Space Agency's Gaia mission, which aims to chart a three-dimensional map of our galaxy.

Read More >

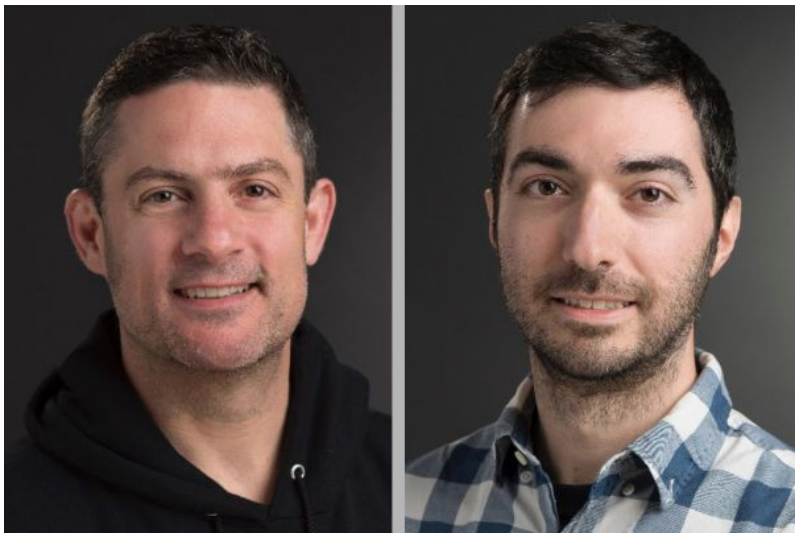


RIT hosts youth summer workshops on clean energy and fuel cells

Professor **Gerald Takacs** and Principal Lecturer **Alla Bailey** of the School of Chemistry and Materials Science hosted workshops this summer to help high school students from the Rochester area learn about the science behind clean energy and fuel cells. The "Clean Energy: Electricity Generation Using Fuel Cells" workshops featured hands-on experiments and tours of RIT's facilities.

Participants constructed hydrogen-oxygen fuel cells, conducted lab-based experiments about hydrogen storage, explored RIT's solar farm and more. The event organizers hope the experience will help youth learn about scientific careers that are becoming increasingly in demand.

Read More >



RIT scientists recognized for solving issue with thermal instrument aboard Landsat 8 satellite

RIT senior scientists in the Chester F. Carlson Center for Imaging Scinece, **Aaron Gerace** and **Matthew Montanaro,** were presented with the USGIF Academic Achievement Award at the GEOINT 2019 Symposium in San Antonio, TX on June 4 for their work on the Landsat 8 satellite.

Read More >

RIT's Inclusive Excellence program engages rising sophomore students in research

RIT's Inclusive Excellence Summer Research Fellowship program is helping more students from nontraditional pathways get hands-on experience in scientific research early in their academic careers through a unique summer program focused on mentorship. The program, led by Associate Professors **Lea Michel,** School of Chemistry & Materials Science and **Dina Newman,** Thomas H. Gosnell School of Life Sciences along with IE postdoctoral researcher **Brittney Wyatt**, paired nine students entering their second year at RIT with faculty mentors to perform research on topics ranging from organic photovoltaics to microplastics.

Read More >

Newsmakers

Alla Bailey, principal lecturer in the School of Chemistry and Materials Science, served as moderator of the 14th World Bioenergy Congress and Expo, held June 6-7 in London. The event had the theme "Green Revolution: Let's go green to get our globe clean." While at the meeting, she presented the paper titled "Clean Energy Generation Using Fuel Cells (Educational Experience)," co-authored by **Gerald Takacs**, professor of chemistry.

Matthew Hoffman, associate professor in the School of Mathematical Sciences, served as a panelist at the first Great Lakes Circular Economy Forum in Toronto on June 25-26. Co-convened by UN Environment North America, the City of Toronto and the Council of the Great Lakes Region, the forum is an invitation-only, bi-national dialogue on promoting circular economy in the Great Lakes region.

Emmett Ientilucci, assistant professor in the Chester F. Carlson Center for Imaging Science, had an article, "Atmospheric Compensation of Hyperspectral Data: An Overview and Review of In-Scene and Physics-Based Approaches," published in the June 2019 issue of Geo-Science and Remote Sensing Magazine.

Jeff Lodge, associate professor in the Thomas H. Gosnell School of Life Sciences, presented a paper titled "The remediation of food processing wastewater by various microalgae and biomass production" at the ninth International Conference on Algal Biomass, Biofuels, and Bioproducts in Boulder, Colo., June 17-19.

Michael Murdoch, assistant professor of color science, presented an invited paper, "Dynamic color control in multiprimary tunable LED lighting systems," in the Advanced Solid State Lighting Session at the Society for Information Display (SID) Technical Symposium in San Jose, CA, May 12-17.

Jason Nordhaus, assistant professor of science and mathematics at NTID, presented on barriers to entry in STEM fields for deaf and hard-of-hearing students at The Science Accessibility Conference June 28-29 at The Ohio State University.

Kaitlin Stack Whitney, visiting assistant professor in the science, technology and society department and the environmental sciences program, was selected as an EDSIN-QUBES Open Education Fellow for 2019-2020. The Environmental Data Science Inclusion Network (EDSIN) created this leadership program to advance the intersection of environmental studies and discipline-specific data science with a focus on inclusive pedagogy, universal design for learning, engaging with underserved communities and social justice.

Hao Xie, a Ph.D. student in color science, presented a poster at the Society for Information Display (SID) Technical Symposium in San Jose, CA titled "Color Mismatches across Commercial Displays: Modeling the Effect of Observer Metamerism" with faculty co-authors **Susan Farnand** and **Michael Murdoch**, both assistant professors in the Program of Color Science. The conference is the largest international display conference in the world.

Sponsored Research

Scott Brown, CIS, is the PI on a $51,138 grant from the Department of Energy and Lawrence Livermore National Lab to support the project titled “DIRSIG Simulation Demonstration for LLNL.”

Moumita Das, SoPA, is the PI on a $570,001 grant from the National Science Foundation to support the project titled “Collaborative Proposal: Bottom-up Construction of a Synthetic Neuron and Programmable Neuronal Network.”

Don Figer, CfD, is the PI with Co-PIs Edwin Hach (SoPA), Stefan Preble (KGCOE), Jing Zhang (KGCOE), and Ben Zwickl (SoPA) on a $149,214 grant from the NSF to support the project titled “QLCI - CG: Quantum Photonic Institute.”

Christopher Kanan, CIS, is the PI on a $41,358 grant from Discontinued Materials Inc. to support the project titled “Advancing Automation for Texture Analysis.”

Christopher Kanan, CIS, is the PI with Co-PI **Christy Tyler**, GSoLS, on a $99,985 grant from the NYS Department of Environmental Conservation to support the project titled “Using Artificial Intelligence on Street View Imagery to Detect High Priority Invasive Plant Species in New Year State.”

Carlos Lousto, SMS/CCRG, is the PI on a $50,000 grant from the NSF and the University of Illinois – Urbana Champaign to support the project titled “Sustained-Petascale in Action: Blue Waters Enabling Transformative Science and Engineering.”

Zoran Ninkov, CIS, is the PI on a $48,000 grant from ThermoFisher Scientific with an additional $9,000 supplement from the NYS Department of Economic Development at the University of Rochester to support the project titled “Development of Quantum Dot Coated Detector Arrays.”

Minh Pham, SMS, is the PI on a $25,568 grant from Rochester Regional Health Systems to support the project titled “Biostatistical analyses of data generated from children prone to upper respiratory infections.”

Jie Qiao, CIS, is the PI on a $17,692 grant from NYSTAR/University of Rochester – Center for Electronic Imaging to support the project titled “Femtosecond laser-based fabrication of photonic waveguides toward waveguide lasers.”

COS In the Media

‘Intersections: The RIT Podcast’

COS faculty were featured on Intersections this summer:

Professor **André Hudson**, GSoLS, mentored three area high school students and their collaboration led to the discovery of a rare bacterium that kills E. coli. The group published its findings in an academic journal. In this episode of Intersections, Hudson talks with Kit Mayberry, RIT

vice president for strategic planning and special initiatives, about what he learned about himself as a teacher and a scientist on the project.

Don Figer, director of RIT's Center for Detectors, offers advice on how to build a career in science to Dom Oddo, a Case Western Reserve student who recently participated in a National Science Foundation Research Experience for Undergraduates at RIT.

Learning assistants bring a different perspective to a student's educational experience. At RIT, the Center for Advancing STEM Teaching, Learning and Evaluation trains undergraduates to be learning assistants and facilitate small-group or other interactions in the classroom. **Dina Newman**, associate professor in the Thomas H. Gosnell School of Life Sciences, and recent biology graduate **Gretchen Horst** talk about how the program works and the goals it achieves.

Sky & Telescope
Did a Dwarf Galaxy Crash into the Milky Way?
Vice
A 'Ghost Galaxy' May Have Given the Milky Way Its Signature Swirl
Business Insider
Scientists detected signs of our Milky Way colliding with another 'ghost' galaxy
Science News
Astronomers may have spotted the ghost galaxy that hit the Milky Way long ago
Research by SoPA Assistant Professor **Sukanya Chakrabarti** highlighted.

How Stuff Works
Primary Colors Are Red, Yellow and Blue, Right? Well, Not Exactly
How Stuff Works talks to **Mark Fairchild**, professor and director of the color science program and Munsell Color Science Laboratory, about additive and subtractive color systems.

WROC-TV
RIT hosts PEER Workshops
WROC-TV reports on RIT's summer PEER Workshop program, led by Professor **Scott Franklin**, SoPA.

City Newspaper
RIT scientists using technology to fight invasive plants
City Newspaper reports on work by Assistant Professor **Christopher Kanan,** CIS and Associate Professor **Christy Tyler**, GSoLS.

WXXI

Plant Cover in Cities Could Combat 'Urban Heat Island Effect'

NPR features a story by WXXI in which GSoLS professor **Karl Korfmacher**, discusses how asphalt creates “urban heat islands” and how vegetation can combat the effects of heat waves.

The Conversation

Curious Kids: How does the stuff in a fire extinguisher stop a fire?

Curious Kids asks SCMS Senior Lecturer **Joseph Lanzafame** to explain how fire extinguishers work.

Gizmodo

How Historians Can Now See Invisible Text on Ancient Manuscripts

Gizmodo talks to **David Messinger**, director of the Chester F. Carlson Center for Imaging Science, about using multispectral imaging to reveal ancient text and preserve fading medieval manuscripts.

PBS

Health effects of micro plastics

PBS station WCNY features GSoLS Associate Professor **Christy Tyler** and SMS Associate Professor **Matthew Hoffman** in this episodeof Cycle of Health. The segment begins at the 9:40 minute mark in the video.

Live Science

What Happens in Intergalactic Space?

Live Science talks to SoPA Assistant Professor **Michael Zemcov** about the Cosmic Infrared Background Experiment.

ZooNooz

An unstoppable partnership: Seneca Park Zoo and RIT

ZooNooz, a publication by the Seneca Park Zoo, highlights projects with RIT.

Our mailing address is:
College of Science
84 Lomb Memorial Dr
Rochester NY 14623