RIT | College of Science

MONTH IN REVIEW

March 2019

We're beginning to sense the end of the semester approaching. Faculty and students are deep into their research at this point in the year and COS faculty are frequently winning new research awards. This month we share some of the exciting new advances that our faculty are making with regards to eye-tracking technology, student engagement, cardiac electrophysiology, and the impact of e-cigarettes.

We are also excited to share the news of some of our faculty members winning significant national and international recognition: **Manuela Campanelli** was selected to be a 2019 International Society on General Relativity and Gravitation Fellow; **Suzanne O'Handley's** outstanding mentorship over several years earned her the 2019 Goldwater Council on Undergraduate Research Faculty Mentoring Award; **Scott Williams** received a summer fellowship to conduct research at the Air Force Research Laboratory, and **Ben Zwickl** was awarded the prestigious Faculty Early Career Development Program Award from the National Science Foundation. Congratulations to all of these faculty for their outstanding work that represents the best of the College of Science and RIT.

Additionally, many faculty and students were recognized this month for outstanding contributions to the university. This month we celebrated RIT's **Outstanding Undergraduate Scholars**, COS's **John Wiley Jones Outstanding Students in Science**, and the GSoLS **Baldwin Scholars**. **Elizabeth Cherry** was announced as one of the recipients of the RIT Trustees Scholarship Awards for her outstanding scholarship contributions, and as we shared last month, **Jennifer Connelly** received the Isaac L. Jordan Sr. Faculty Pluralism Award.

It was just 10 years ago that our **Astrophysical Sciences and Technology** program got underway and we are thrilled that such a new program has met such a great success. The Astrophysical Sciences and Technology program is celebrating its 10th year as a Ph.D. program this year and continued recognition as one of the best astrophysics Ph.D. programs in the country.

You can read more about all of these achievements in the stories below.

SOPHIA MAGGELAKIS
Dean, RIT College of Science

Student & Alumni News

Twenty Years of Science with Chandra and Ten Years with AST

On March 4, the Astrophysical Science and Technology program hosted RIT alumnus **Rodolfo Montez Jr.**, a member of the first class to graduate with a Ph.D. from RIT's **Astrophysical Sciences & Technology** program, for a celebration of "Twenty Years of Science with Chandra" --and Ten Years of the AST Program.
Dr. Montez presented a smorgasbord of science highlights drawn from the Chandra X-ray Observatory's two decades of spectacularly successful operation. As Chandra (a NASA Great Observatory, in the Hubble Space Telescope line), completes its 20th year of operation, the AST program is celebrating its tenth anniversary. So it's especially fitting that Rudy -- now a scientist in the Director's Office of the Chandra X-ray Center, at Smithsonian Astrophysical Observatory -- returned to RIT at this time to describe Chandra's illustrious history of discoveries in astrophysics.

Outstanding Undergraduate Scholars honored

Eight graduating College of Science students were among the 109 RIT students recognized for their outstanding academic careers at RIT at the Outstanding Undergraduate Scholars ceremony on March 28th. Since 1976, RIT has honored the top 1% of students that are able to maintain a record of academic excellence while also giving back to their community through civic or volunteer work, conducting research, or being engaged in co-op or work in their field of study. We were pleased to celebrate with these College of Science students:

- **Milky Abajorga** – Biotechnology & Molecular Bioscience and Biomedical Sciences

- **Yang Goh** – Chemistry
- **Leander Held** – Physics
- **Samantha Lauro*** – Chemistry
- **Jacob Palmerio** – Physics
- **Kylie Pleakis*** – Applied Mathematics
- **Emma Snyder*** – Biochemistry
- **Christopher Webster** – Physics

*denotes scholars who are members of the RIT Honors Program

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John Wiley Jones Outstanding Students in Science recognized

Five College of Science students were recognized for significant contributions to the RIT community in addition to maintaining a distinguished academic record while completing their studies in rigorous coursework. The students were celebrated at a dinner in their honor keynoted by **Dr. Beronda Montgomery** of Michigan State University, the 2019 John Wiley Jones Distinguished Speaker. The students receiving recognition were:

- **Sophia Kourian**, Chester F. Carlson Center for Imaging Science
- **Brian Lake**, School of Physics & Astronomy
- **Sean Lewis**, School of Chemistry & Materials Science
- **Logan Melican**, School of Mathematical Sciences
- **Trevor Penix**, Thomas H. Gosnell School of Life Sciences

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Life Sciences honors Baldwin Scholars

Each year the faculty of the **Thomas H. Gosnell School of Life Sciences** (GSoLS) honor the legacy of the late Professor David Baldwin by awarding David M. Baldwin Memorial Scholarships to students who are outstanding scholars with recognized service to GSoLS, RIT, and the wider community. This year, six life sciences students received recognition at the Baldwin Scholars Award ceremony on March 22.

The **David M. Baldwin Memorial Scholarships** are supported financially from the estate willed to RIT following Professor Baldwin's untimely death in 1975. Professor Baldwin graduated from Reed College, held a Master of Science degree in microbiology and taught biology from 1945 to 1974. Teaching was his love and drive, and he spent many extra hours assisting students who were having difficulties in his courses. His dedication to teaching earned him one of the first Outstanding Teaching Awards ever awarded at RIT. His desire to help students obtain a sound education at RIT is perpetuated by these scholarships. The 2019 winners of the David M. Baldwin Scholarships are (Left to Right in photo):

- **Trevor Penix**, Biotechnology & Molecular Bioscience
- **Spencer Richman**, Bioinformatics
- **Kaylee Steiner**, Biotechnology & Molecular Bioscience
- **Amanda Weiss**, Biotechnology & Molecular Bioscience
- **Guy Azriel**, Biotechnology & Molecular Bioscience and Biomedical Sciences
- **Nicole Cavanaugh**, Biotechnology & Molecular Bioscience (not pictured)

Students receive funding to attend NSBE attend national conference

Third year physics student, **Micah Campbell** and first year University Exploration student, **Olive Andries** received funding from the College of Science to attend the **45th Annual National Society of Black Engineers (NSBE) Convention** in Detroit, Michigan on March 27-31. During the convention students from around the world were able to attend workshops to assist with professional growth, participate in competitions and network with collegiate and professional members. Students also had the opportunity to attend a career fair where recruiters from the top companies in the United States were looking for students from various disciplines.

Student Spotlight: Showing the artistic side of science

Artwork by **Deirdre Cannon**, first-year biotechnology and molecular bioscience student was highlighted in the Student Spotlight in RIT's News.

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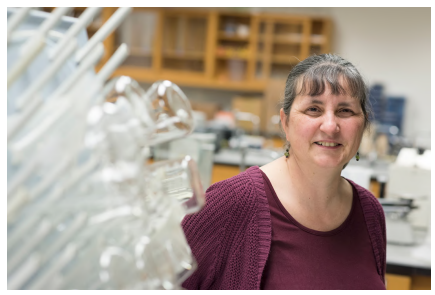
Our Stories and News

COS welcomes John Wiley Jones Distinguished Speaker for talks on research and faculty mentoring

The College of Science and the Thomas H. Gosnell School of Life Sciences welcomed **Dr. Beronda Montgomery**, Foundation Professor in the Plant Research Laboratory at Michigan State University as this year's John Wiley Jones Distinguished Speaker. In her lecture, titled "Seeing the Light: Plant Color Vision and Developmental Acclimation," Dr. Montgomery shared her research about the specific mechanisms of light mediation affecting the growth and development of plants. Although her studies are on the cellular scale, her findings are adding significantly to the knowledge of our natural world.

In addition to her significant research on plant development, Dr. Montgomery is also an expert on faculty development and mentoring. In this capacity, she was invited by the Inclusive Excellence Initiative to give a second presentation on that topic. Her workshop, "Lighting the Way: Building Bridges to Access and Success Through Progressive Mentoring," translated the lessons that have emerged from investigating the specific ways in which largely immobile organisms adapt their patterns of growth and development to fluctuations in external environmental parameters to increase their survival and productivity to mentoring and professional development interventions. These lessons are intended to inform practices that promote the success of participants in academic sciences.



Chemistry professor recognized for outstanding mentoring

Dr. Suzanne O'Handley is the recipient of the *2019 Goldwater Council on Undergraduate Research Faculty Mentoring Award*. This well-deserved honor recognizes Suzanne's great work in mentoring and preparing College of Science students to win Goldwater scholarships; Under Suzanne's leadership, 27 of our students have been the recipients of these prestigious scholarships and another 5 have been recognized with Honorable Mentions. The Barry M. Goldwater Scholarship is the premier undergraduate award for students interested in pursuing a career in mathematics, the natural sciences, or engineering. The award is based on academic merit, and virtually all winners plan on pursuing a Ph.D. Many have extensive undergraduate research experience as well.

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Math associate professor recognized for significant scholarship

Dr. Elizabeth Cherry, associate professor in the School of Mathematical Sciences, is one of the recipients of the *2018-19 Trustees Scholarship Award*. The Trustees Scholarship Awards were established to recognize RIT faculty who have demonstrated outstanding track record of academic scholarship that is integral to all aspects of a student's educational experience at RIT. The selection process involves extensive review by the COS Trustees Scholarship Awards Committee, the COS Executive Council, and the Deans Council. The final selection is made by the Education Committee of the RIT Board of Trustees. Congratulations, Elizabeth for this well-deserved honor and thank you for your dedication to your scholarship and to our students!

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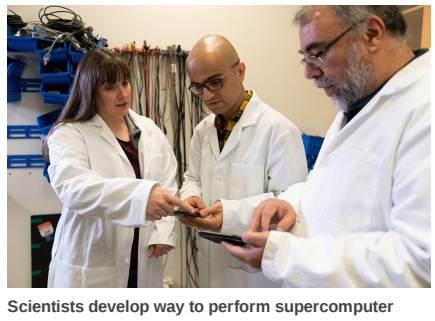

Scientists develop way to perform supercomputer simulations of the heart on cellphones

You can now perform supercomputer simulations of the heart's electrophysiology in real time on desktop computers and even cellphones. **Dr. Elizabeth Cherry**, associate professor of mathematics, director of RIT's Mathematical Modeling program, and co-author of a new *Science Advances* article that introduces the new methodology, is a part of the team of scientists from Rochester Institute of Technology and Georgia Tech that developed a new approach that can not only help diagnose heart conditions and test new treatments, but pushes the boundaries of cardiac science by opening up a floodgate of new cardiac research and education.

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RIT faculty earns federal award to study how to help more students become scientists and engineers

Assistant Professor **Dr. Ben Zwickl**, in the School of Physics and Astronomy, was awarded the prestigious Faculty Early Career Development (CAREER) Program Award from the National Science Foundation for his work entitled "Learning to solve problems in context-rich environments: A naturalistic study in STEM workplaces, research labs, project-based courses and lab courses". This study will assess how experiential learning improves interest, retention and career preparation.

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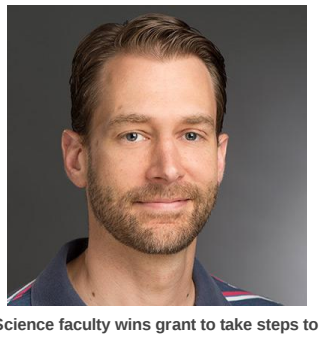
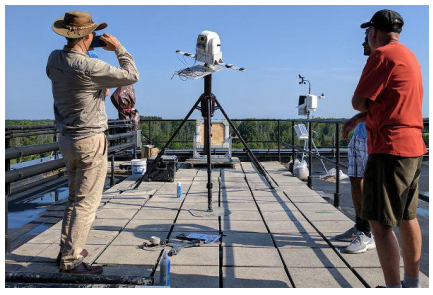


Color Science faculty wins grant to take steps to increase diversity

Dr. Michael Murdoch, assistant professor in the Integrated Sciences Academy's Program of Color Science is leading a team that won a Connect Grant from AdvanceRIT with the goal to broaden and diversify the academic network for both research collaborations and future faculty searches. The grant will fund at least two "Collaboration Visits" of women and/or ALAANA scientists to RIT's Munsell Color Science Laboratory, where they can present their work, spend some time with faculty and graduate students, and possibly start up a research collaboration. Color Science faculty will coordinate with RIT's Office of Faculty Diversity and Recruitment as they identify and invite candidates, and will be guided by their grant mentor, Dr. Twyla Cummings, dean of Graduate Education.



RIT researchers developing ways to use hyperspectral data for vehicle and pedestrian tracking

Researchers, led by Associate Professor and Applied and Computational Mathematics MS Program Director **Dr. Matthew Hoffman**, have received a $600,000 grant to study hyperspectral imaging. Their research boils down to how these imaging systems can track pedestrians or vehicles – and if they're better than methods currently used. Hyperspectral imaging can pick up bands of light that the human eye cannot. The hope is that the new imaging can help identify targets from afar, so that a person or vehicle can be more easily tracked. The project requires a multidisciplinary approach and Matt will work closely with researchers from RIT's Chester F. Carlson Center for Imaging Science. Co-PIs include Professor **Anthony Vodacek**, Distinguished Researcher **Donald McKeown** and Assistant Professor **Christopher Kanan.** The project will use a hyperspectral video system developed by Associate Professor and Frederick and Anna B. Wiedman Chair **Charles Bachmann**. Senior Research Scientist **Adam Goodenough** and several Ph.D. students will also collaborate on the project.

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RIT researchers set to help LIGO resume hunt for ripples in space and time

The Nobel Prize-winning project that hunts for gravitational waves— ripples in space and time—is about to begin the longest and most sensitive observational run to date. The National Science Foundation's Laser Interferometer Gravitational-Wave Observatory (LIGO) received a series of upgrades to its lasers, mirrors and other components and will start its third Advanced LIGO observing run on April 1. Several researchers in the **Center for Computational Relativity and Gravitation (CCRG)** who are members of the LIGO Scientific Collaboration are preparing to pore over the new data to help uncover some of the universe's biggest mysteries.

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‘U.S. News’ ranks RIT among best graduate schools

U.S. News released their latest ratings of collegiate-level academic programs in the United States. The annual rankings measure the quality of professional school programs in business, education, engineering, law, medicine and nursing, based on statistical and reputational surveys about the school’s faculty, research and students. Beyond the six disciplines listed annually, *U.S. News* also periodically ranks programs in science, social sciences and humanities, fine arts, health and other areas based on academic reputation surveys. RIT’s **Astrophysical Science and Technology** program is tied with Syracuse University for 69th among physics graduate programs.

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User behavior is key in RIT’s e-cigarette research that is meant to inform FDA regulations

Risa Robinson, professor of mechanical engineering and director of the Respiratory Technology Laboratory, and her team of researchers which includes **Dr. Nathan Eddingsaas,** assistant professor, SCMS have taken a different approach to assessing e-cigarette usage, and it’s turned up some attention-getting results.

Robinson studies users in their own environments, puffing on their own e-cigarettes, rather than on test machines in lab settings. And what she’s found is that they are puffing as much, if not more, than traditional cigarette users, resulting in potentially higher exposure to harmful substances. Her team’s work on the safety of different types of e-cigarette devices and flavored juices is among the foundational information the Food and Drug Administration (FDA) is seeking to regulate e-cigarettes.

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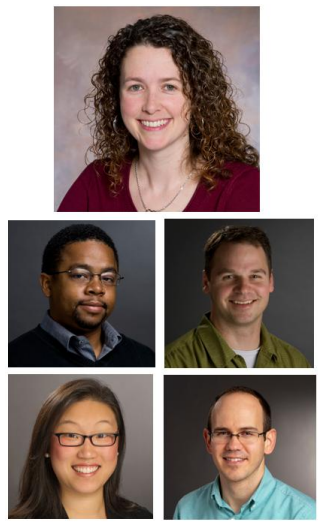

Chemistry faculty recipients of Provost’s Learning Innovation Grant

The Provost announced that a group of chemistry faculty are among this year’s recipients of the PLIG or Provost’s Learning Innovation Grant. Led by Professor **Christina Goudreau**, the team will study, “Development and Implementation of Retrieval Cues in Organic Chemistry, and Evaluation of their Effects on Knowledge Transfer.” Also participating in the research are Associate Professors **Jeremy Cody**, **Michael Coleman**, **Lea Michel**, and Lecturer **Douglas “D.J.” Tusch**.

DataFest 2019

Dr. Ernest Fokoue, associate professor of statistics in the School of Mathematical Sciences, coordinated the annual **DataFest** competition held in Xerox Auditorim at RIT on the final weekend of the month. DataFest is a 3 day competition for undergraduates who enjoy searching for meaningful patterns in data sets. This year 24 teams of students from RIT, University of Rochester, SUNY Geneseo and SUNY Brockport took part in the competition with 14 teams reaching the final stage. 18 graduate students mentored the teams and assisted throughout the weekend and 11 faculty consultants mentored and judged the competition.

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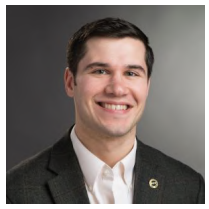
New director of Science Exploration Program announced

Dr. Jeff Mills, lecturer in the School of Chemistry and Materials Science will be stepping into the role of Director for the Science Exploration Program beginning this June. He is taking the place of **Dr. Roger Dube** who will retire at the end of the academic year. The science exploration option allows first-year students to investigate the various majors in the College of Science before deciding on a program of study.



New Sr. Development Director announced

In early November, **Mark Gaul**, our director for development, was promoted to the Sr. Director of Principal Gifts. Mark has been with Development and Alumni Relations since 2004, and served the Senior Director of Development for the College of Science and for the College of Health Science and Technology. Mark completed the transition to his new position at the end of March and on April 1, we will welcome **Kevin Sackett** as he joins the University Development and Engagement team as Director of Development for the College of Science and College of Health Sciences and Technology.

Kevin is coming to RIT from his alma mater, SUNY Cortland, where he served as a Major Gifts and Planned Giving Officer. Kevin managed a full portfolio, established seven new endowed scholarships in the last 18 months and is on track to close $1 million in commitments this year. He previously served as Assistant Director for Athletics and Physical Education at Cornell University, overseeing annual fundraising, donor recognition, and athletic alumni engagement. Kevin has a BS in Sport Management and is a former collegiate athlete/captain of the SUNY Cortland wrestling team. Please help us welcome Kevin to the College when you see him.

New Minors to be facilitated by ISA

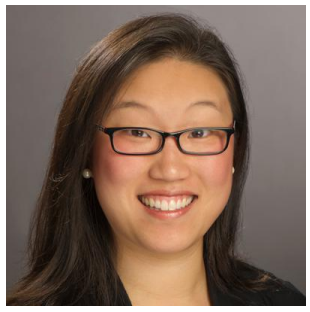
We are pleased to announce that the Integrated Sciences Academy will have two new minors to accompany their previously established programs in Color Science and Science Exploration. Both minors, **Applied Cognitive Neuroscience** and **Art of Science / Science of Art** were approved by the Institute Curriculum Committee and should be available for declaration in the next academic year.

CCRG Director named 2019 ISGRG Fellow

The president of the International Society on General Relativity and Gravitation announced **Dr. Manuela Campanelli,** director of the **Center for Computational Relativity and Gravitation** (CCRG) as one of the new ISGRG Fellows for 2019. She is being recognized "for her contributions to the solution of the binary black hole problem and the studies of highly magnetized matter around them." The induction into the Fellowship will take place officially during the Society business meeting in July 2019 in Valencia, Spain.

Summer Fellowship at AFRL WPAFB Dayton

Dr. Scott Williams, professor of inorganic chemistry was awarded an Air Force Research Laboratory (AFRL) Summer Fellowship that will include taking one graduate student, **Alex Knowles**, to Wright-Patterson Air Force Base in Dayton, OH for a 10-12 week intensive research experience.



Bridging the academic divide

Dr. Lea Michel, associate professor, SCMS was invited to speak at an event sponsored by Rochester Bridges to the Doctorate for Deaf and Hard-of-Hearing Students as part of their World of Wonder in Science Seminar series. Lea's talk, titled "From Physics to Chemistry to Biology and Back" was held on Friday, March 29 at the Dyer Arts Center at NTID.

Brick by Brick film premiere

On March 28, Friend of the College and director of RIT's Diversity Theater Program, **Tina Chapman DaCosta** premiered "Brick by Brick," a film that tells the story of her grandfather's journey to overcome obstacles to become a man on his own terms. "Brick by Brick" is a powerhouse of real-world conflicts and challenges, both past and present day. This 16-minute film is the first in Diversity Theater's Brick by Brick Diversity & Inclusion Film and Workshop Series, and will be used for future workshops encouraging meaningful discussions on diversity and inclusion. The film premiere was followed by a discussion with the director.

Attending to Mental Health

Faculty, staff, and students were invited to attend the **Inclusive Excellence Initiative's** session on mental health, facilitated by Dr. Alan Smerbeck, RIT assistant professor of psychology. Attendees at the session on March 20 learned to identify signs of serious mental illness and campus resources, and discussed the best ways to support student mental health.

Screening of "Unlikely"

On March 29, GSoLS Principal Lecturer, **Dr. Sandi Connelly** coordinated a film screening and discussion with the co-director of the documentary film, "Unlikely." Set in the cities of Akron, Atlanta, Boston and Los Angeles, the film investigates America's college dropout crisis through the lives of students navigating the broken higher education system and the innovators working to close the opportunity divide.

COS Staff Advisory Council hosts laboratory tours

While the students were away on Spring Break, the College of Science staff had an opportunity to see how the laboratories throughout the college are used on a daily basis and what all of the noise they've been working through over the past couple of years is leading to! Tours were conducted of the Imaging Science Lab, the newly renovated Life Sciences lab and the Chemistry lab. Many thanks to **Joe Pow** of CIS, **Jennie Liedkie** of GSoLS, and **Tom Allston** of SCMS for hosting the event.

Sponsored Research

Charles Bachmann, CIS, is the PI on a $194,000 grant from the Department of the Navy, Office of the Chief of Naval Research to support the project titled "Remote Multi-Sensor Multi-Angular Terrain Characterization."

Emmett Ientilucci, CIS, is the PI with CoPIs **Jan van Aardt** and **Donald McKeown** (CIS) on a $271,050 grant from the Department of Energy / UT-Battelle, LLC to support the project titled "Fundamental Image Science Research."

Joel Kastner, CIS, is the PI on a $360,431 grant from NASA to support the project titled "Exploring Planet Formation in the Nearest Known Protoplanetary Disks."

Jie Qiao, CIS, is the PI on a $69,283 grant from the National Science Foundation to support the project titled "Ultrafast-laser-based polishing for freeform optics and additive manufacturing."

Ben Zwickl, SoPA, is the PI on a $486,124 grant from the National Science Foundation to support the project titled "CAREER: Learning to solve problems in context-rich environments: A naturalistic study in STEM workplaces, research labs, project-based courses and lab courses."

Newsmakers

Sukanya Chakrabarti, assistant professor, SoPA, and **Jason Nordhaus**, NTID assistant professor of physics and a faculty member in RIT's Ph.D. program in astrophysical sciences and technology, were invited by the Research Corporation for Science Advancement (RCSA) to participate in a Scialog (Science Dialog) on Time Domain Astrophysics in Tucson, AZ, May 9-12. At the Scialog, approximately 50 Fellows will pursue collaborative, high risk, highly impactful discovery research on untested ideas applicable to creating breakthroughs in fundamental science. Both faculty are members of RIT's Center for Computational Relativity and Gravitation, whose simulations of merging black hole binaries were used by the LIGO Project to confirm the breakthrough detection of gravitational waves from binary black holes in space.

Kaitlin Stack Whitney, visiting assistant professor in the science, technology and society department and the environmental sciences program, was selected as a Mozilla Open Leader for spring 2019. Mozilla Open Leader is a competitive, global program for people who are recognized as leaders in "open" research practices and provides them mentoring on projects.

Grover Swartzlander, professor in the Chester F. Carlson Center for Imaging Science, will present "From Science Fiction to Science Fact" at the NASA Innovative Advanced Concepts (NIAC) Inventive Genius Lecture at the Chicago Museum of Science & Industry on April 13.

Discover
Are Insects Going Extinct? The Debate Obscures the Real Dangers They Face
Discover quotes insect ecologist **Kaitlin Stack Whitney**, visiting assistant professor in the science, technology and society department and the environmental sciences program.

Universe Today
Weekly Space Hangout: March 20, 2019 – Dr. Michael Zemcov of NASA's SPHEREx Mission
Universe Today's "Weekly Space Hangout" features **Michael Zemcov**, an assistant professor in RIT's Center for Detectors and the School of Physics and Astronomy.

INSIGHT into Diversity
Physics Is the Least Diverse of the Sciences, and the GRE Could Be a Barrier
INSIGHT into Diversity reports on a study led by RIT Professor **Casey Miller** that discovered that traditional admissions metrics for physics Ph.D. programs do not predict completion and hurt the growth of diversity in physics.

WHAM-TV
RIT researchers receive $600,000 grant to study imaging beyond what the human eye can see
WHAM-TV features latest research by Associate Professor **Matthew Hoffman**

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