

R·I·T Science+Math

SUMMER IN REVIEW



The summer may be quieter with fewer students on campus, but the season continued to be a busy time in the College of Science. Faculty and students took advantage of the lull to attend study abroad programs, conduct research projects, present at professional conferences, and develop their professional networks outside the university. I'm excited to share some of the exciting activities that have been engaging our professors and students this summer in this edition of our newsletter.

The college experienced some significant losses this summer. The passing of a friend and former dean of the college, Dr. John Paliouras, Professor Emeritus in the School of Mathematical Sciences deeply saddened us. And the Gosnell School of Life Sciences said goodbye to Dr. David Lawlor who lost his long battle with cancer at the end of May. These two professors had far-reaching impacts on the college in their time with us and they will be greatly missed.

We also had internal staff transitions take place when Susan Tontarski, our long-time events coordinator retired to enjoy her summer lakeside. Our new events coordinator, Melanie Green, is now onboard and ready to take on the new semester.

Our first set of laboratory renovations are nearing completion! New equipment is added to the materials science lab, the genomics lab, and the microbiology lab every day, setting the stage for years of innovative research activities in the college. We are all excited to put these spaces to good use after more than a year without them.

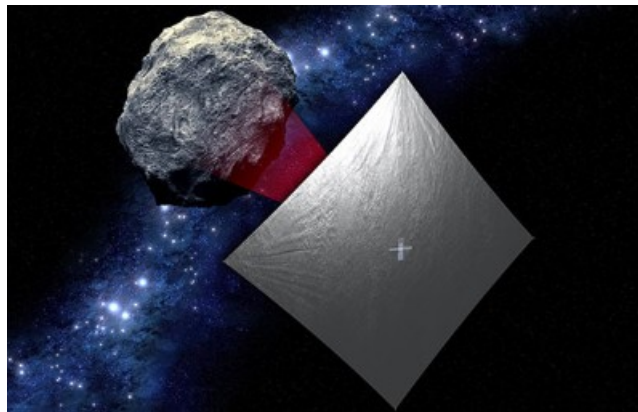
And our progressive seven-year plan merges President Munson's goal of increasing research activities within the college with our mission of providing

outstanding instruction for our science and mathematics students.

We are proud of how our college is growing and shaping the scientific leaders of tomorrow. I hope you enjoy reading about the impact the College of Science has made throughout the university and beyond.

SOPHIA MAGGELAKIS
Dean, RIT College of Science

Our Stories and News



Solar sail uses metamaterials to generate more power

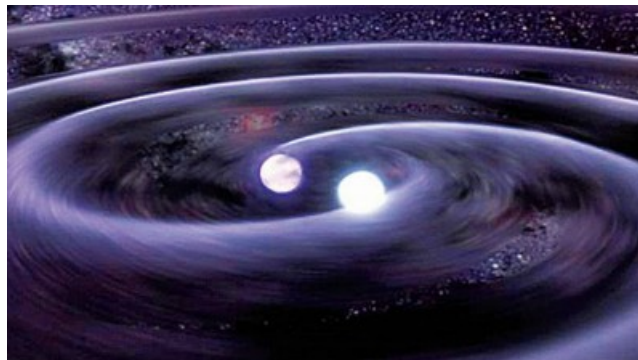
Grover Swartzlander, professor in RIT's Chester F. Carlson Center for Imaging Science, is taking solar sailing to the next level with advanced photonic materials. This new class of materials could be used to steer photons and enable near-Earth, interplanetary and interstellar space travel. News about this new technology was highlighted on in several local and national news stories this summer:

[RIT's University News](#), July 16

[The Motherboard](#), July 18

[USA Today](#), July 18

[WROC](#), July 25



CCRG researchers earn major opportunities

Manuela Campanelli, director of the Center for Computational Relativity and Gravitation (CCRG), received word that NASA is awarding the center \$1.3 million over 3 years to start a new [Theoretical and Computational Astrophysics Network](#) (TCAN) binary neutron star post-merger simulation program entitled, “Advancing Computational Methods to Understand the Dynamics of Ejection, Accretion, Winds and Jets in Neutron Star Mergers.” The project will be lead from RIT and will have collaboration nodes at Johns Hopkins University, NASA Goddard Space Flight Center, and University of West Virginia. Up to this point, TCANs have only been awarded to major R1 intuitions.

Additionally, CCRG was awarded 163.2 million CPU hours on the Blue Waters super computer at University of Illinois at Urbana-Champaign to be used before the end of March 2019 to study Magnetohydrodynamics (MHD) simulations of accreting super massive binary black holes (SMBBHs) entitled, “Photons from Binary Black Hole Inspirals.” Such a large allocation of time on the Blue Waters system will set the stage for the SMBBH and BNS programs to be successful on new exascale supercomputers as they come online in the next few years.



Keck Foundation grant awarded

Moumita Das, associate professor of physics, is a co-PI on a [Keck Foundation](#) grant for a project titled, “Building an Artificial Motile Tissue through Self-Organized Rhythmic Stiffening.” The grant PI is from the University of San Diego. Das is the only modeler/theorist on the team of experimental researchers. Keck Foundation grants tend to fund endeavors that are distinctive and novel in their approach. The foundation encourages projects that are high-risk with the potential for transformative impact.



David Lawlor Endowed Service Award fund established

David Lawlor, associate professor of life sciences, lost his long and courageous battle with cancer in May. David was a dedicated educator, a great colleague, and a kind and humble gentleman. He will be greatly missed by all of us and by the many people he touched. In his honor, the David Lawlor Endowed Service Award was established to celebrate the life and legacy of our dear colleague.



RIT is one of the nation's top universities for NSF undergraduate research programs

Rochester Institute of Technology is hosting seven federally funded research programs this summer, the most of any college in New York state. More than 50 undergraduate students from around the country are in Rochester to try their hand at research as part of the Research Experience for Undergraduates (REU) program through the National Science Foundation (NSF). RIT has received nearly \$2 million in funding to support these programs. The seven NSF-funded Research Experience for Undergraduates sites at RIT include 4 hosted by College of Science faculty:

- [Extremal Graph Theory and Dynamical Systems](#): Led by Darren Narayan, professor of mathematics.
- [Summer Undergraduate Research for Students who are Deaf or Hard-of-](#)

[Hearing in Applying Mathematical and Statistical Methods to Problems from the Sciences](#): Led by Bonnie Jacob, assistant professor of mathematical modeling.

- [Imaging in the Physical Sciences](#): Led by Roger Dube, professor of imaging science.

- [Multimessenger Astrophysics](#): Led by Joshua Faber, associate professor in RIT's School of Mathematical Sciences.

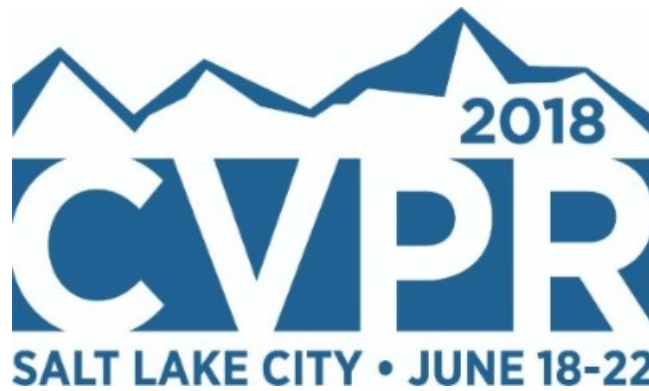
The [NSF-funded REU program](#) is designed to open U.S. students' minds to graduate school and build life-long capabilities for continued research careers. The NSF is currently funding 721 REU sites across the country. The RIT REU students presented their projects at the annual Undergraduate Research Symposium on August 3.

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CASTLE hosts summer program to advance research methods

Scott Franklin, professor in the School of Physics and Astronomy, and faculty associates Eleanor Sayre (Kansas State University) and Mary Bridget Kustusich (DePaul University) ran a two-week summer program through the Center for Advancing STEM Teaching Learning and Evaluation (CASTLE) titled "[Professional-development for Emerging Education Researchers \(PEER\)](#)" on the RIT campus. Participants were from University of Rwanda, Georgia Southern University, University of Florida, University of Utah, NYU Abu Dhabi, University of Regina, Illinois State University and RIT. The goal of the conference was to develop a diverse research network who will continue to collaborate about research methods and theories via bi-weekly video conferences throughout the year.



COS colleagues and students participate in the Computer Vision and Pattern Recognition (CVPR) conference

Guoyu Lu, assistant professor in imaging science, was an organizer and program chair of the International Workshop on Visual Odometry & Vision Applications Based on Location Cues at [CVPR 2018](#), the premier conference in the field of computer vision, held June 18–22 in Salt Lake City.

Additional College of Science participants included **Nathan Cahill**, associate professor, School of Mathematical Sciences; **Kushal Kafle**, an imaging science Ph.D. student; and **Tyler Hayes**, an imaging science Ph.D. student who presented papers at CVPR 2018.



Life sciences principal lecturer elected to ANNY Executive Board

[Sandi Connelly](#), principal lecturer, GSoLS, was elected to the Executive Board of the [Assessment Network of New York](#) (ANNY). The mission of ANNY is to advance the quality assessment of institutional effectiveness and to enhance the success of institutions of higher education and their students in New York state.



SMASH for Girls celebrates 5 years of impact

The fifth annual [SMASH Experience for Girls](#) (Summer Math Applications in Science with Hands-on Experience for Girls) was held over the course of a week in July for rising 8th grade girls. A [career fair](#) at the end of the week brings in corporate sponsors to demonstrate ways to apply math to solve real problems.



RIT Faculty make an impression at Munsell Centennial Color Symposium

Faculty from the Program of Color Science attended the [Munsell Centennial Color Symposium](#) this summer at the Massachusetts College of Art and Design in Boston, MA. **Roy Berns**, professor and Richard S. Hunter Chair, **Susan Farnand**, assistant professor, **Mark Fairchild**, professor and head of ISA, director of PoCS, and **David Wyble**, associate scientist, were invited speakers at the symposium.

Mark Fairchild, professor and head of ISA, director of PoCS, was the winner of the Inter-Society Color Council (ISCC) 2018 Nickerson Service Award for outstanding, long-term contributions towards the advancement of the Council and its aims and purposes.



Life Sciences professor wins funding to attend Active Teaching and Learning workshop

Kaitlin Stack Whitney, visiting assistant professor in the science, technology and society department and the environmental sciences program, was selected and received funding to attend a collaborative workshop on active teaching and learning in conservation biology in postsecondary education, hosted by the [Center for Biodiversity Conservation](#) at the American Museum of Natural History June 13-15 in New York City.



Life Sciences professor participates in Leadership Institute

Dina Newman, associate professor in the Thomas H. Gosnell School of Life Sciences, participated in the [PKAL STEM Leadership Institute](#) in Adamstown, Md., July 10-15. The program provided faculty with the theory and practice required to effectively manage the politics of change and contribute to the national STEM higher education reform.



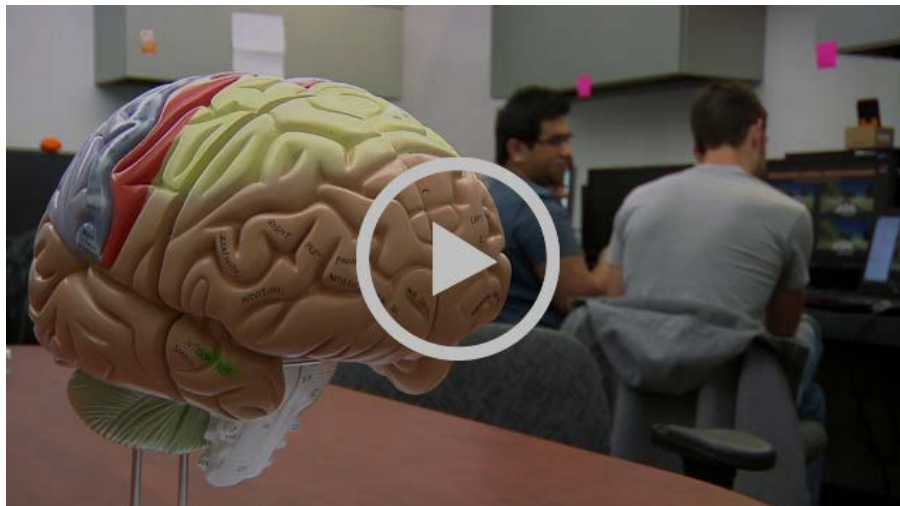
Emeritus professor and former dean of RIT's College of Science, passed away at the age of 89

Dr. John Paliouras began his long career at RIT in 1965 as an assistant professor in the department of mathematics. In 1979, became the third dean of the College of Science. In his quiet way, Dean Paliouras carried out a long and sustained campaign that eventually established the College of Science as the example to be emulated. He did so through granting the college's academic departments individual identity and independence, fund-raising for scholarships, equipment and the building addition, attracting outstanding faculty, development of several new programs, persistent and uncompromising emphasis on excellence in teaching, grantsmanship, support of faculty research and development, and effective student recruitment that became the model for the institute's recruitment strategy. Dean Paliouras retired in 2002.

Since 2003, an award established in his name, the John D. Paliouras Award for Outstanding Academic Excellence, has recognized a third-year or above student from the computational mathematics, applied mathematics or applied statistics and actuarial science programs.

John was an exceptional colleague, responsible and efficient administrator, mentor and faculty member who will be greatly missed by the many people he touched.

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Mapping Artificial Intelligence at RIT

Dhiresha Kudithipudi and **Christopher Kanan** are professors with different kinds of students. Their classrooms are labs, and the students are high-tech computers they are “teaching to think.”

Kudithipudi, a professor of computer engineering, and Kanan, an assistant professor of imaging science, are part of a growing group of RIT researchers working in a field broadly known as artificial intelligence, or AI. It’s essentially about building increasingly complex algorithms—the rules that govern their operating systems—so that the machines can perform tasks that normally require human intelligence, including making decisions.

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Sports Analytics Conference

The College of Science and the School of Mathematical Sciences sponsored a one-day workshop showcasing state-of-the-art research in analytics for college and professional hockey and sports in general. **Matthew Hoffman**, associate professor, SMS and Ryan Stimson, Co-director of Analytics for the RIT Men's Hockey team, hosted the 4th annual workshop on August 11, featuring analysis of data and statistics in a variety of sports including curling, lacrosse and football.

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COS collaboration with the Seneca Park Zoo

Rochester Institute of Technology is sharing its tiger pride by sponsoring the tiger exhibit at the Seneca Park Zoo. It's the latest collaboration between RIT and the zoo, which last year signed a formal memorandum of understanding to develop, promote and implement mutually beneficial projects.

Several RIT faculty and students in many diverse disciplines including environmental science, game design, and museum studies have shared their knowledge and interest to benefit the zoo over the past several years. Current COS collaborators include **Kaitlin Stack Whitney**, a visiting assistant professor in the science, technology and society department and in the environmental science program, who provided guidance for a capstone project related to the zoo's [pollinator habitat restoration](#) projects; Environmental Science senior lecturer **Elizabeth DiCesare**, whose aquatic ecology class replicated the zoo's [One Cubic Foot](#) biodiversity assessment in several areas of the Genesee River and has submitted a National Science Foundation proposal that includes the project as part of a public health assessment; and RIT **imaging science** students who plan to create a 3D scanner for insects that the zoo society will use as part of their biodiversity assessments locally and in other ecosystems, including Madagascar.

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RIT contributes to success of photonics initiative

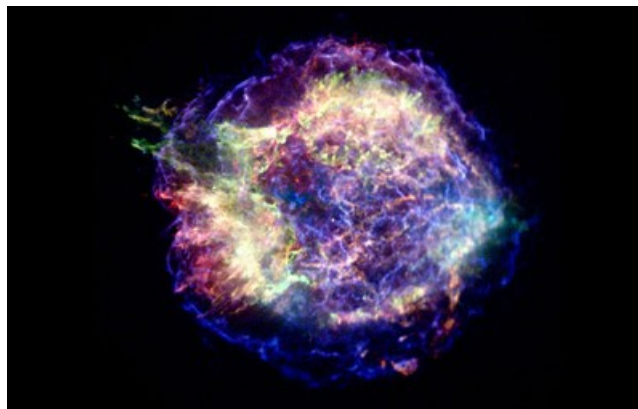
The Future Photon Initiative is an RIT signature research area led by **Don Figer**, professor and director, Center for Detectors. Figer's group is developing quality-control protocols for a national photonics manufacturing hub.

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Senior Lecturer leads enrichment class

Vivek Narayanan, senior lecturer of physics, led a physics class during the East House Enrichment program which took place at RIT over the course of two weeks in June. The program is designed to broaden other treatment and rehabilitation services and to encourage participants who are recovering from mental illness or substance abuse disorders to pursue educational goals to achieve independence and self-sufficiency. Classes include wellness, Chinese, team building, dance, physics and more.



Galaxy outskirts likely hunting grounds for dying massive stars and black holes

Findings from a Rochester Institute of Technology study led by **Sukanya Chakrabarti**, assistant professor, School of Physics and Astronomy, provide

further evidence that the outskirts of spiral galaxies host massive black holes. These overlooked regions are new places to observe gravitational waves created when the massive bodies collide, the authors report. The study, "[Supernova Rate beyond the Optical Radius](#)," will appear in an upcoming issue of Astrophysical Journal Letters.

Co-author **Brennan Dell**, '18, a recent graduate from RIT's computer science program, analyzed the data with Chakrabarti during his undergraduate co-op. NASA and National Science Foundation awards funded Chakrabarti's study and contributions from co-authors Dell and **Benjamin Lewis**, postdoctoral researcher at RIT's [Center for Computational Relativity and Gravitation](#) in addition to several co-authors from other institutions worldwide.

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Sponsored Research

Mishkatul Bhattacharya, SoPA, is the PI on a \$118,300 grant from the DOD.Department of the Navy, Office of the Chief of Naval Research / University of Rochester to support the project titled "Mesoscopic quantum science and metrology with levitated mechanical systems."

Scott Brown, CIS, is the PI on a \$20,000 grant from the DoD.National Geospatial-Intelligence Agency (NGIA) / Pennsylvania State University to support the project titled "DIRSIG5 Scene Development Support."

Elizabeth Cherry, SMS, is the PI with co-PI **Matthew Hoffman**, SMS, on a \$234,989 grant from the NSF-National Science Foundation to support the project titled "Collaborative Research: Developing a quantitative three-dimensional understanding of cardiac arrhythmias."

Moumita Das, SoPA, is the PI on a \$217,029 grant from the NSF-National Science Foundation to support the project titled "Collaborative Research: Decoding and encoding mechanistic relations between structure and function in crack resistance of articular cartilage and cartilage inspired biomaterials."

Susan Farnand, PoCS, is the PI with co-PI **Michael Murdoch**, PoCS, on a \$63,200 grant from Samsung Electronics Co., Ltd./Samsung Advanced Institute of Technology to support the project titled "Measurement and Analysis of Visual Differences Between Electronic Displays."

Kara Maki, SMS, is the PI with co-PI **David Ross**, SMS, on a \$50,000 grant from Bausch & Lomb/Vision Care to support the project titled "Improved Mathematical Modeling & Computer Simulation of Contact Lens Dynamics."

Casey Miller, SCMS, is the PI on an \$89,516 grant from the National Science

Foundation to support the project titled "Collaborative Research: IGE: Scaling Faculty Development to Broaden Participation in Graduate Education."

Zoran Ninkov, CfD, is the PI on an \$18,000 grant from the NYS Department of Economic Development / University of Rochester and an additional \$18,000 grant from Thermo Fisher Scientific to support the project titled "Development of Quantum Dot Coated Detector Arrays."

Jie Qiao, CIS, is the PI on a \$24,985 grant from the DOE-Department of Energy / Lawrence Livermore National Lab to support the project titled "Ultrafast Laser Welding for Hermetic Packaging of Nano-implant Chip."

David Ross, SMS, is the PI on a \$25,000 grant from the NYS Department of Economic Development / University of Rochester to support the project titled "Improved Mathematical Modeling & Computer Simulation of Contact Lens Dynamics."

Kaitlin Stack-Whitney, GSoLS, is the PI on a \$200,000 grant from the University Transportation Research Council/NYS Department of Transportation to support the project titled "C-17-12 Effects of Modified Mowing Regime in NYSDOT ROWs on Pollinators and Vegetation."

Christy Tyler, GSoLS, is the PI on a \$29,992 grant from the National Geographic Society to support the project titled "Improving Estimates of Salt Marsh Resilience and Coastal Blue Carbon."

Christy Tyler, GSoLS, is the PI on a \$4,385 grant from the NYS Department of Environmental Conservation / Rochester Museum and Science Center to support the project titled "Increasing Public Stormwater Education, Outreach and Participation within the Shipbuilders Creek Watershed, Webster NY."

Student & Alumni News



Chateaubriand
Fellowship Program

Astrophysical Sciences & Technology student wins prestigious fellowship

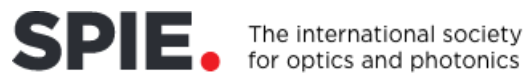
Astrophysical Sciences & Technology PhD candidate, **Jesse Bublitz** was selected as a 2018-19 STEM Chateaubriand Fellow by the French Embassy. The [Chateaubriand Fellowship](#) is a grant offered by the Embassy of France in the United States to support **outstanding Ph.D. students from American universities who wish to conduct research in France for a period ranging**

from 4 to 9 months. Chateaubriand fellows are selected through a merit-based competition, through a collaborative process involving expert evaluators in both countries. Jessie will spend the fall semester in Grenoble, France working with colleagues of his mentor, **Joel Kastner**, professor of imaging science.



Physics alumnus wins teaching award

The PhysTEC Teacher of the Year Award is given annually to outstanding high school physics teachers who have graduated from physics teacher preparation programs at a PhysTEC member institution. PhysTEC recognizes up to one local Teacher of the Year from each coalition member and a single National Teacher of the Year. This year physics alumnus, **Bradley Gearhart, '04** was a local winner for SUNY Buffalo State. Bradley now shares his love of physics with a whole new generation at Hutchinson Central Technical High School where he encourages higher enrollments, supports extracurricular activities, and actively participates in both the physics and the physics education communities.



Imaging science student wins award for best paper

The Society of Photographic Instrumentation Engineers (SPIE) is the international society for optics and photonics. SPIE hosts a series of conferences throughout the year that focus on all aspects of photonics and optics.

Margot Accettura, MS student in imaging science won the Best Paper award at the 2018 [SPIE Astronomical Telescopes and Instrumentation](#) conference, held this June in Austin, TX. Her topic was Hyperspectral detection of methane stressed vegetation based on research conducted with mentor **Carl Salvaggio**, professor of imaging science, and **Timothy Bauch**, senior lab engineer in imaging science, and Joe Mallia of NYSEARCH/NGA.

Other COS students and faculty presenting at the SPIE ATI conference included [Kevan Donlon](#), an imaging science Ph.D. student; **Chi Nguyen**, an astrophysical sciences and technology Ph.D. student; **Stefi Baum**, research professor of imaging science; **Anton Travinsky**, an imaging science Ph.D. student; **Dorin Patru**, associate professor, electrical and microelectronic engineering; **Dmitry Vorobiev**, post-doctoral researcher, Chester F. Carlson

Center for Imaging Science; **Don Figer**, professor and director, Center for Detectors; and **Zoran Ninkov**, professor of imaging science.



RIT's undergraduate student innovators unveil research at 27th annual symposium

More than 250 student projects, representing all 9 RIT colleges, were presented at the 27th annual Undergraduate Research Symposium on August 3. The participants included over 100 COS students and faculty in 6 different COS programs. The students presented the projects that they worked on through their summer research programs.

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Astrophysical Sciences & Technology alums receive recognition for outstanding graduate research

The RIT office of graduate education announced that **Dr. Triana Almeyda** is the recipient of the 2018 RIT Graduate Education Dissertation Award (mentor Andrew Robinson) and **Daniel Wysocki** is the recipient of the 2018 RIT Graduate Education MS Thesis Award (mentor Richard O'Shaughnessy). These awards were established in 2015 to be awarded to an RIT doctoral

alumnus and Master of Science alumnus to recognize exceptional graduate research, and to encourage the recognition of PhD dissertation and MS thesis at the national and international level. The awards will be presented at the Graduate Alumni Award ceremony and reception on Brick City Homecoming weekend, Friday, October 19 in the Crossroads River Room.



Company founded by Color Science alumnus places in accelerator competition

Two client companies in [Rochester Institute of Technology's Venture Creations](#) incubator have won recognition and prize money from the New York state-funded [Luminate NY](#) accelerator program. One of the companies, [Positive Science](#), founded in 2006 by RIT alumnus **Jason Babcock** '03, '00 (color science, imaging and photographic technology), won 3rd place in the competition and \$250,000. Positive Science is a head-mounted eye-tracking and behavioral analysis system that can be used by clients for a variety of projects. Hardware systems are customizable to allow researchers to explore applications in all areas of eye tracking; software provides an eye-tracking solution for the Mac OS platform that uses intuitive calibration and custom graphics. The company also provides post-capture reviews and comprehensive training.

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Newsmakers

Friend of the College, **Tina Chapman DaCosta**, director of [Diversity Theater](#), Division of Diversity and Inclusion, was featured in Lake Affect Magazine, vol. 53, June 2018. The article, titled "The Modern Day Renaissance Woman: Tina Chapman DaCosta," was written by **Debra A. Jacobson**, marketing and outreach specialist in the Center for Advancing STEM Teaching, Learning and Evaluation (CASTLE). Elizabeth Lamark, visual resource producer, Marketing and Communications, provided the photography.

[What does it take to make an institution more diverse?](#)

nature.com

June 6 - Lea Vacca Michel, associate professor of biochemistry, featured

[Hampton grad, RIT award winner, recognizes former high school teacher](#)

The Tribune-Review

June 15 - **Nicholas Wilkins**, fourth-year B.S./M.S. computer science and computational mathematics student, featured

[What is the maximum theoretical size of any star before it violates the laws of physics?](#)

astronomy.com

June 27 - **Don Figer**, professor and director, Center for Detectors, featured

[Will we see living dinosaurs in our lifetime?](#)

WXXI.org

July 5 - **Larry Buckley**, associate professor Thomas H. Gosnell School of Life Sciences and associate dean, featured

[Russians hacked into US electric utilities: 6 essential reads](#)

The Conversation

July 24 - **Roger Dube**, research professor and director, science exploration program, feature article

[Scientists discover new hangout for blackholes](#)

geek.com

July 27 - **Sukanya Chakrabarti**, assistant professor, School of Physics & Astronomy, quoted

[Early Career Professionals Spotlight](#)

Entomological Society of America

Kaitlin Stack-Whitney, visiting assistant professor, environmental sciences, profiled

[RIT Working to foster inclusion in the sciences](#)

WXXI.org

August 3 - **Kaitlin Stack-Whitney**, visiting assistant professor, environmental sciences, featured

[Incredible Hulk? Nah, This Glowing, Green Light in the Night Sky Is a Comet](#)

Live Science

August 6 - **Brian Koberlein**, senior lecturer of physics, quoted

[Leading a New Generation of Change-Makers](#)

August 16 - **Bobby Moakley**, 4th year environmental science B.S. student, featured

[Tons of plastic trash enter the Great Lakes every year--where does it go?](#)

The Conversation

August 16 - **Matthew Hoffman**, associate professor, School of Mathematical

Sciences and **Christy Tyler**, associate professor, Thomas H. Gosnell School of Life Sciences, contributors

[Don't worry, your cereal probably won't poison you with pesticides](#)

Mashable

August 17 - **Kaitlin Stack-Whitney**, visiting assistant professor, environmental sciences, quoted

[RIT on TV: Move-in Day, with SG President Bobby Moakley](#)

Spectrum News

August 21 - **Bobby Moakley**, 4th year environmental science B.S. student, featured

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