R·I·T Science+Math

MONTH IN REVIEW

Fall is in the air and the semester is in full swing. Our Brick City Homecoming weekend was an unparalleled success with many families and alumni stopping by Gosnell Hall to share a little science and math excitement in mid-October. Our student groups had exhibits in the Bruce & Nora James Atrium while faculty offered sessions on a wide variety of topics highlighting the research that they spearhead for undergraduate students. Alumni also had a chance to stop in to see the newly renovated laboratory spaces and the renovations that are still in progress. Additionally, our COS Student Advisory Board hosted a Speed Networking brunch reception to give current COS students some time to connect with COS Alumni. Bagels and fun were had by all!

We hosted this year's first lecture in the Distinguished Speaker Series this past month. Dr. Ronald Breaker of Yale University joined us to share his research about Ribozymes and Riboswitches. And the Inclusive Excellence group hosted a Focus Group Discussion to examine the results of a preliminary survey which examines inclusion and diversity within the College of Science. We will continue to use these findings over the next few years to help us shape the future of the college.

The College of Science has so much to be proud of these days. Our faculty are researching and teaching, publishing and presenting, guiding and collaborating. It is a joy to lead this team in creating a positive educational experience for our students. I hope that you will enjoy reading about these accomplishments in the articles below.

SOPHIA MAGGELAKIS
Dean, RIT College of Science

Student & Alumni News

Astrophysical Sciences & Technology alums receive recognition for outstanding graduate research

Dr. Triana Almeyda '17 and **Daniel Wysecki** '17 were honored at the annual Graduate Alumni Awards reception during Brick City Weekend to celebrate their outstanding research during their PhD and MS programs respectively in Astrophysical Sciences and Technology. The awards were presented by Dr. Twyla Cummings, Dean of Graduate Education and Provost Ellen Granberg.

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Astrodynamics Team takes on a new project

The RIT SPEX (Space Exploration) club, is always on the lookout for new projects to test their knowledge and help them prepare for the future. Each year they launch a high altitude balloon with a scientific payload. This semester, the Astrodynamics Team is working throughout the semester to restore an old telescope.

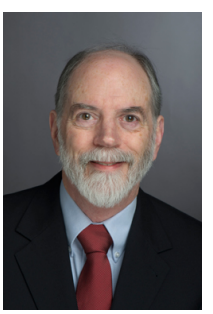
Honors Students and Alumni Annual Networking Dinner

On October 25, College of Science Honors students shared a networking dinner with six local COS Alumni at the Del Monico Steakhouse. This annual event builds connections within the COS community and gives students a chance to prepare for life after RIT.

Our Stories and News

Alumni, students and families gather during Brick City Homecoming

Gosnell Hall was a hub of activity during the annual Brick City Homecoming weekend, October 19-21. On Saturday, the **College of Science Student Advisory Board (COS SAB)** hosted their annual Speed Networking brunch for COS alumni and current COS students where alumni helped students build their professional networks and prepare for life after RIT. Many families got a taste of the excellent teaching their students encounter in the College of Science though our Classes Without Quizzes offering including, "Fermentation, the Good, the Bad, and the Yummy" or took advantage of the sunny skies to enjoy the Garden Walk out to the community garden. Student groups presented hands-on math puzzles, demonstrated lava lamps, explained the laws of physics while sharing physics activities, and showed off the micro properties of peppers throughout the day in the Bruce & Nora James Atrium.



SoPA Professor receives award for distinguished service

We are delighted to share the news that **Robert Teese**, professor, SoPA will be honored with the 2019 Homer L. Dodge Citation for Distinguished Service to the American Association of Physics Teachers at the 2019 winter meeting in Houston, TX. Established in 1953 and renamed in recognition of AAPT founder Homer L. Dodge in 2012, the Homer L. Dodge Citation for Distinguished Service to AAPT is presented to members in recognition of their exceptional contributions to the association at the national, sectional, or local level.
Dr. Teese is a pioneer in the use of video analysis. He initiated and directs the LivePhoto Physics project, which published a book of video-analysis activities for introductory physics courses and is currently developing Interactive Video Vignettes for physics and biology courses. This project has held frequent workshops for university and high-school teachers at AAPT meetings, including multi-day workshops.

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Research on elephants could translate to robotics

Understanding how elephants use their trunks to pick up small objects could lead to robots designed with flexible hands or grippers, according to a new study that includes research by RIT scientist **Scott Franklin**, professor, SoPA.

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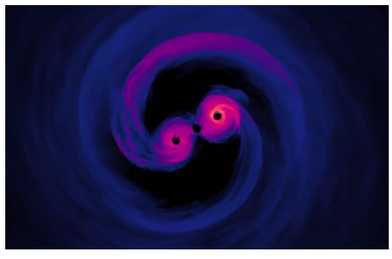

Computer simulation follows light to supermassive black holes

The hunt is on for orbiting pairs of supermassive black holes on the verge of collision. Researchers at Rochester Institute of Technology have built the first simulation that could lead scientists to them.

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Drone remote sensing workshop in Rwanda

Anthony Vodacek, professor, CIS conducted a 5-day workshop on drone remote sensing in Rwanda in the week of October 29. This workshop was initially funded by the IEEE Geoscience and Remote Sensing Society as an international outreach effort for the society. Additional funding came from the African Center of Excellence in Internet of Things at the University of Rwanda to deliver this workshop. CIS PhD candidate, **Ryan Ford** and research scientist **Tim Bauch** assisted in the workshop as well.

COS hosts Ronald Breaker as first Distinguished Speaker

The College of Science hosted Dr. Ronald Breaker of Yale University as the first Distinguished Speaker of this academic year. Dr. Breaker's presentation titled "Ribozymes and Riboswitches: Modern Biological Descendants from the Ancient RNA World?" sparked a renewed appreciation of the importance of cell and molecular biology research among the faculty, staff and students who attended the lecture.

Inclusive Excellence hosts Forum on Inclusion & Diversity

On October 24, the **Inclusive Excellence** group hosted a forum to discuss the results of their survey examining faculty perspectives about inclusion in the College of Science. You can see the survey questions here: https://bit.ly/2DdiLfC. Results will be shared at a later date.

SMS associate professor completes new textbook

Michael Radin, associate professor, SMS has finished and published a textbook entitled "Periodic Character and Patters of Recursive Sequences, Developing intuition about pattern recognition" in Springer Press. The textbook focuses on discrete periodic patters of first order, second order and higher order difference equations. Aimed toward advanced undergraduate students and graduate students who have taken a basic course in Calculus I and Discrete Mathematics, this book serves as a core text for a course in Difference Equations and Discrete Dynamical Systems.

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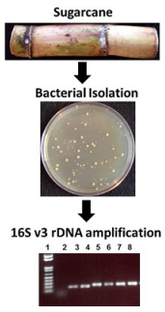

GSoLS collaborators publish paper in Journal of Genomics

A group of collaborators in the Thomas H. Gosnell School of Life Sciences published a paper in the Journal of Genomics describing the isolation and genomic analyses of 6 bacteria isolated from sugarcane grown in Jamaica. This was the first publication from RIT where the entire sequencing was done in house using the new next generation sequencing platform. GSoLS Post-Doc **Anutthaman Parthasarathy** and Han Ming Gan of the Centre for Integrative Ecology, School of Life and Environmental Sciences, Deakin University, Geelong, Victoria, Australia, were the lead authors. Other authors from GSoLS were **Narayan H. Wong**, research scientist, **Michael A. Savka**, professor, **KayLee K. Steiner**, 4th year biotechnology undergraduate student, **Kurtis R. Henry**, 3rd year biotechnology undergraduate student, and **André O. Hudson**, professor and Academic Unit Head. This paper is dedicated to the memory of Dr. David Lawlor.

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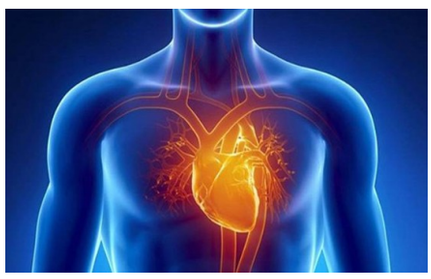
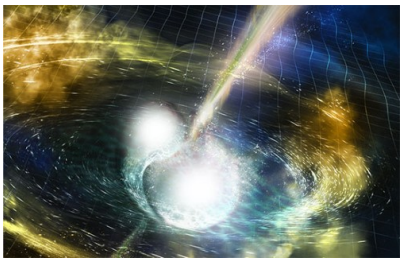


Dean's Research Initiation Grant leads to NSF funding

Neils Otani, assistant professor, SMS and his collaborator Cristian Linte, professor, KGCOE were able to secure a collaborative grant though NSF, Office of Advanced Cyber-infrastructure, using seed funding from a Dean's Research Initiation Grant to generate preliminary data for the proposal. The D-RIG money was used to fund a student for more than a year and present his work at two international conferences, along with publishing a journal article. This then lead to a collaboration with Dr. Suzanne Shontz of the University of Kansas, producing a few joint author conference abstracts, one peer-reviewed article and then the fully funded NSF grant submission titled "A Computational Framework for Reconstructing and Visualizing Myocardial Active Stress."

CASTLE hosts STEM Ed research forum

On October 30, the **Center for Advancing STEM Teaching, Learning, and Evaluation** hosted an interdisciplinary research forum on research in STEM education during which presenters shared ideas for funding research in this field. GSoLS professor, **Dina Newman** presented a talk on "Web Tools and Analysis of Assessment Date for Biology Education Research" and Life Sciences visiting assistant professor, **Katilyn Stack-Whitney** presented "Knowledge Flows: 'virtual water' as a case for understanding prizes' impact on STEM." The workshop also included small group discussions and feedback development of new collaborations.



RIT leads multi-university collaboration to simulate neutron star mergers

Rochester Institute of Technology is advancing computer simulations to predict, for the first time, the complete cycle of neutron stars merging with other neutron stars or black holes. These extreme astrophysical events may be a source of heavy elements that make up the Earth and other planets, and represent the new field of multi-messenger astronomy.

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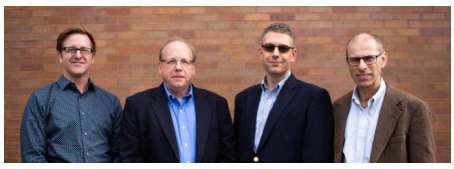

Chemists gather for annual SCMS Advisory Board meeting

The **School of Chemistry and Materials Science** hosted their first SCMS alumni advisory board meeting on October 19. In the photo are advisory board members (l to r) **Brian Antalek**, MS in Materials Science & Engineering '91, **Ralph Wise**, BS in Physical Chemistry '98 MBA '03, **Paul Craig**, SCMS Head, **Anthony Sampognaro**, BS in Biochemistry '98, MS in Chemistry '00, Mike Turberg, BS in Chemistry '85. Not pictured are **Christine Garrett**, BS in Chemistry '93, **Jonathan Cooper** MS in Chemistry '99, and **Donna Chen**, BS in Chemistry '92.

COS Staff & Faculty celebrate Halloween with Science

Staff and Faculty of the **College of Science** got into the spirit of Halloween in a very special way this year: by dressing as elements on the Periodic Table! Students stopped by the Dean's Office lobby to enjoy some cider and donuts or to grab a delicious apple.

Sponsored Research

Manuela Campanelli, SMS, is the PI with CoPIs **Joshua Faber** (SMS), **Jason Nordhaus** (NTID), **Richard O'Shaughnessy** (SMS), and **Yosef Zlochower** (SMS) on a $1,301,037 grant from the NASA to support the project titled "Advancing Computational Methods to Understand the Dynamics of Ejection, Accretion, Winds, and Jets in Neutron Star Mergers."

Seth Hubbard, SoPA, is the PI on a $231,404 grant from the DOD - Department of the Air Force, Materiel Command / Microlink Devices, Inc. to support the project titled "Improved radiation hardness in Multijunction solar cells using wavelength specific photonic structures."

Christopher Kanan, CIS, is the PI on a $205,959 grant from the DOD.U.S. Army Materiel Command to support the project titled "Fast and Efficient Continual Learning without Catastrophic Forgetting."

Michael Murdoch, PoCS, is the PI on a $60,000 grant from the Hunter Lab to support the project titled "Spectral Characters of Non-Isotropic Materials."

Kaitlyn Stack Whitney, GSoLS, is the PI on a $39,550 grant from the National Science Foundation and Kent State University to support the project titled "EAGER: Managing our expectations: quantifying the characteristics of misleading trajectories in ecological processes."

Newsmakers

Can We Find the Home of Our First Interstellar Visitor?
Scientific American
Oct. 1 – Sukanya Chakrabarti, assistant professor, School of Physics and Astronomy, quoted

Hypnotic animation reveals new clues on the glow of supermassive black holes spiraling toward a collision
The Daily Mail
Oct. 3 – Manuela Campanelli, director, Center for Computational Relativity and Gravitation, quoted

New simulation sheds light on spiraling supermassive black holes
Science Daily
Oct. 3 – Manuela Campanelli, director, Center for Computational Relativity and Gravitation, featured

Oct. 10-11 – **John Kerekes**, professor in the Chester F. Carlson Center for Imaging Science, was a keynote speaker at the Hyperspectral Imaging & Applications Conference, held in Coventry, United Kingdom.

Oct. 14-17 – **Jeff Lodge**, associate professor in the Thomas H. Gosnell School of Life Sciences, gave a talk titled "Use of microalgae for nutrient reduction of anaerobic digester effluents and egg processing wastewater" at the 12th Algae Biomass Organization Summit in Houston, Texas

Computer Simulation Sheds Light on Supermassive Black Hole Mergers
Sci-News
Oct. 15 – Manuela Campanelli, director, Center for Computational Relativity and Gravitation, featured

Connections: Discussing Native American identity
WXXI 1370 Connections
Oct. 17 – Roger Dube, Research scientist, panelist

Scientists Look to Elephants to Create Better Robots
R&D Magazine
Oct. 25 – Scott Franklin, professor of physics, featured

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