RIT | College of Science

DEAN'S BULLETIN

December and January in Review

Message from the Dean

We are turning a page on a new semester, a new year, and a new era in the fight against COVID-19. The last two months have brought great change in our world and, hopefully, great change in our prospects for the future as well. As we look back on all that happened these past two months, it's easy to wonder anew at the power of science.

RIT successfully completed the fall semester thanks to the use of scientific information and a dedicated community. The knowledge and insights we gained from the fall has greatly influenced the plan for spring semester. Our life sciences faculty and staff, led by **Dr. André Hudson** and **Dr. Julie Thomas**, have been actively involved in the increased testing capacity afforded by saliva testing. And, outside of RIT's walls we're all celebrating the excellent scientific work done to deliver two high-performance vaccines. Nearly 7 million New Yorkers are on the list eligible to receive vaccinations now – including university professors -- and we're hopeful that university staff and students will be eligible soon. Together, we are getting through this.

Despite all the distractions, RIT has continued to make "Progress in a Pandemic," as our 2021 President's Report is so aptly named. Many College of Science research centers, faculty members and students were highlighted in the report. Those stories are featured in this newsletter and I hope you take a few minutes to read them.

We cannot ignore the difficulties present in our world today, but we can continue to move forward. As Dr. Munson recently stated, "At RIT, the pursuit of goodness – in many shapes and forms – drives us. We must strive for a just world and a more caring community. More than ever, we need to explore, create, discover, and innovate. It's what we do to build a better future."

Finally, I encourage you to take time to participate in one of the many Black History Month events planned by RIT in the coming weeks. This is yet another way we can explore and discover to create a better future.

SOPHIA MAGGELAKIS

Dean, RIT College of Science

Student & Alumni News

Graduate Education Ph.D. Dissertation Award

Kevin Cooke, a 2019 graduate of the Astrophysical Science and Technology Ph.D. program, won the RIT Graduate Education Ph.D. Dissertation Award for "Magnificent Constructions: the Role of Environment on the Stellar Mass Growth of Massive Galaxies." Cooke is now a postdoctoral researcher at the University of Kansas. Congratulations on the recognition of your outstanding work, Kevin!

New economy majors connect with emerging careers

Analytical thinking, complex problem solving, creativity, resiliency, and flexibility are among the top skills needed for emerging careers by 2025. Anticipating these rapid changes in the workplace—further accelerated by lessons learned from the COVID-19 pandemic—RIT is seizing on the opportunity to guide students to “new economy majors” that are multidisciplinary, transformative, and future-focused.

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Alumni use talents during pandemic

RIT alumni continue to give back during the pandemic, helping people, companies, and health care facilities in need. The work of two College of Science graduates is highlighted in the article: **Wendy Salamone '10**

(biotechnology) and **Callie Donahue '18** (biotechnology and molecular bioscience).

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Live birds, management for introverts, and creating new foods among classes awaiting RIT students

The course catalogue includes some very colorful courses for spring semester —literally. **Color Science for the Visual Arts** is an interdisciplinary, online elective involving the intersection of science and art and builds on RIT's rich history as a world leader in color science education and research. The course explores topics such as the building blocks of color, seeing color, producing color, displaying color, reproducing color, and conserving color. It is just one of several unique classes offered throughout the university being held in-person, online, or blended.

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Dr. Munson's Performing Arts Challenge

Who says science and art don't mix? Congratulations to four COS students who are finalists in the RIT Performing Arts Challenge! Watch the performances and cheer on your COS friends on Friday, February 5 to see who wins!

- **Ian Freezman** – Biotechnology & Molecular Bioscience
- **Paige Arieno** – Environmental Science
- **Desire Chiruza** – Applied Statistics & Actuarial Science
- **Taylor Greider** – Applied Mathematics

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Gifts from Alumni & Benefactors

Gift from Delta Environmental helps RIT establish environmental education program at Tait Preserve

The citizen science nonprofit Delta Environmental is establishing a new endowment at Rochester Institute of Technology to create an environmental education program at the Tait Preserve of RIT.

Through the Wayne Harris Delta Environmental Education Endowment Fund, RIT will carry on Delta's mission by incorporating environmental programming and curriculum, as well as forge new relationships with community partners in addition to maintaining partnerships established by Delta.

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Our Stories

RIT begins development of saliva testing for spring semester

Rochester Institute of Technology is developing saliva testing protocols for campus as part of its plan to monitor the prevalence of the SARS-CoV2 virus, the causative agent of COVID-19.

Development of the testing process will be done by André Hudson and Julie Thomas, both faculty-researchers in the Thomas H. Gosnell School of Life Sciences in RIT's College of Science.

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College of Science experiences boom in sponsored research

The College of Science as a whole is coming off a record year in sponsored research. In the 2019-2020 fiscal year, the college received more than $15.6 million in grants for research, up more than $5 million from the year before. “The growth we’ve experienced in research funding is a testament to the quality of work of our faculty, students, and staff,” said Sophia Maggelakis, dean of the College of Science. “We are seeing success not only in our well-established strong areas like imaging science, color science, and astrophysical sciences, but also in emerging areas including mathematical modeling, optics, STEM education, and biotechnology.”

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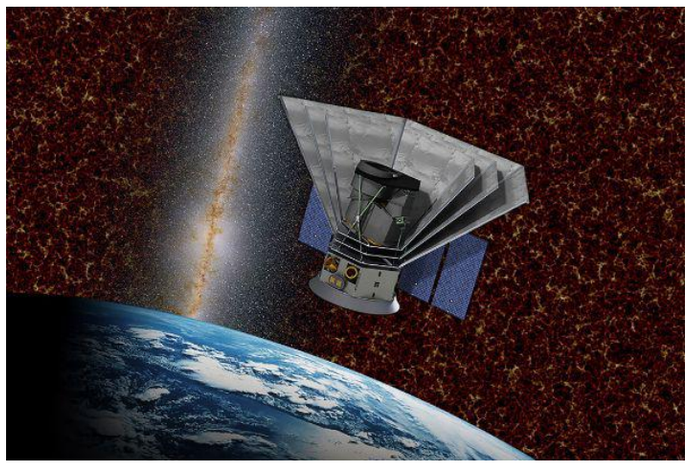

RIT’s Michael Zemcov helping to push new NASA space telescope toward launch

A Rochester Institute of Technology faculty member is helping to prepare an upcoming NASA mission that will look for clues about what happened less than a second after the universe-creating Big Bang. Michael Zemcov, assistant professor in the College of Science’s School of Physics and Astronomy, is part of the Spectro-Photometer for the History of the Universe, Epoch of Reionization and Ices Explorer (SPHEREx) mission, which just officially entered Phase C.

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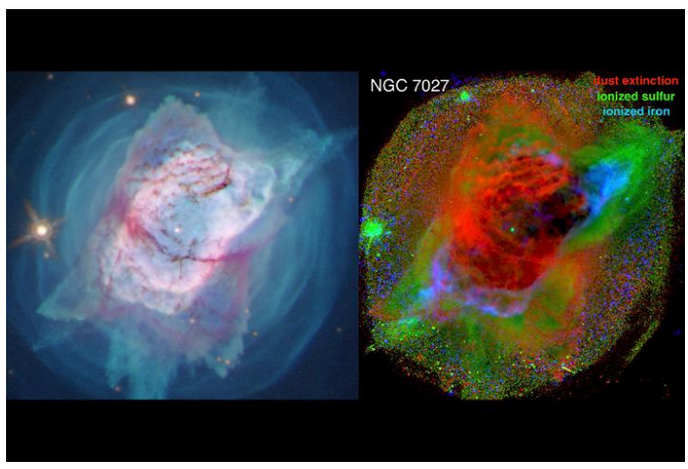

Astronomers dissect the anatomy of planetary nebulae using Hubble Space Telescope images

Images of two iconic planetary nebulae taken by the Hubble Space Telescope are revealing new information about how they develop their dramatic features. Researchers from Rochester Institute of Technology and Green Bank Observatory, led by Joel Kastner, a professor in the Chester F. Carlson Center for Imaging Science and School of Physics and Astronomy, presented new findings about the Butterfly Nebula (NGC 6302) and the Jewel Bug Nebula (NGC 7027) at the 237th meeting of the American Astronomical Society on Friday, Jan. 15.

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Scientists complete yearlong pulsar timing study after reviving long-dormant radio telescopes

Last year, scientists at Rochester Institute of Technology and the Instituto Argentino de Radioastronomía (IAR) began a pulsar timing study using two upgraded radio telescopes in Argentina that previously lay unused for 15 years. Professor Carlos Lousto, a member of RIT's School of Mathematical Sciences and the Center for Computational Relativity and Gravitation (CCRG), said the first year of observations proved to be very accurate and provided some bounds to gravitational waves, which can help increase the sensitivity of existing pulsar timing arrays.

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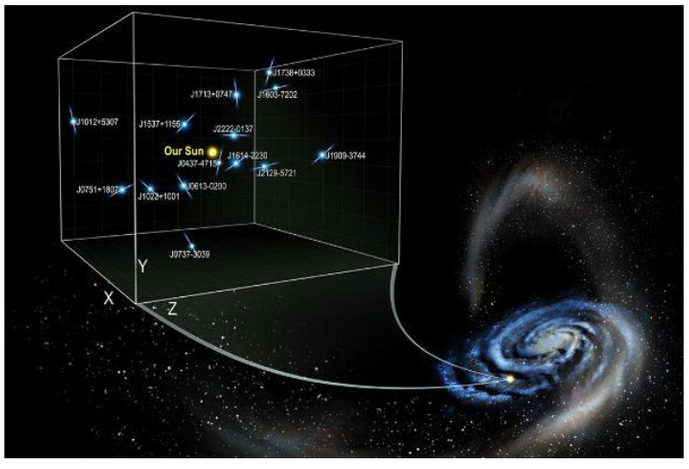

Measurements of pulsar acceleration reveal Milky Way's dark matter density

Researchers have used pulsar measurements to help uncover new information about the density of dark matter in our home galaxy. In a new study led by Rochester Institute of Technology Associate Professor Sukanya Chakrabarti to be published in *Astrophysical Journal Letters*, researchers have now obtained the first direct measurement of the average acceleration taking place within the Milky Way.

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Research takes flight at Tait Preserve

Scientists began conducting research at the Tait Preserve of RIT for the first time this summer. Researchers from the Chester F. Carlson Center for Imaging Science's Digital Imaging and Remote Sensing Laboratory were the first to use the site, collecting data using imaging technology flown on unmanned aerial systems (UAS), or drones.

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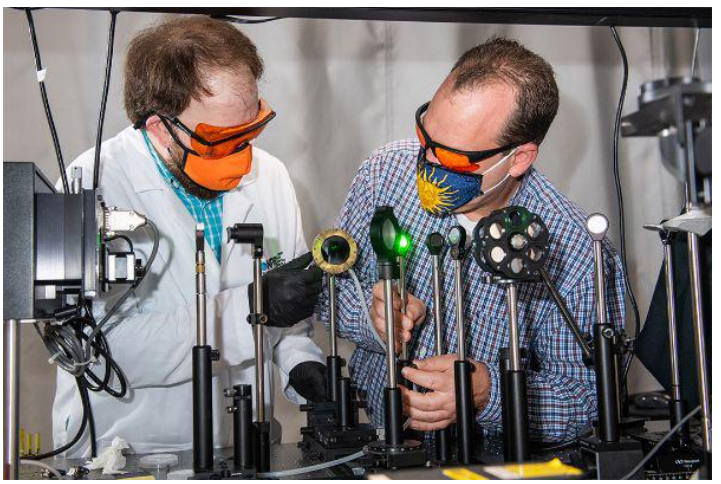

RIT Professor receives DOE grant to develop low-cost, high-efficiency solar cells

A Rochester Institute of Technology professor received a grant from the Department of Energy to research ways to develop low-cost, high-efficiency solar cells. Professor Seth Hubbard, professor in the School of Physics and Astronomy and director of the NanoPower Research Laboratories, received nearly $400,000 from the DOE to attempt to dramatically reduce the cost of high-efficiency solar cells by using a process called spalling to make the substrates solar cells are grown on reusable.

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RIT imaging scientist receives funding to improve how LiDAR can be used to study forests

Imaging scientists at Rochester Institute of Technology have several new projects in the works to improve the way waveform LiDAR can be used to study forests. Professor Jan van Aardt from the Chester F. Carlson Center for Imaging Science received a $194,000 award from the National Geospatial-Intelligence Agency and a $197,000 award from NASA for two different but interrelated remote-sensing projects.

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RIT professor developing drone imaging systems to help farmers monitor grapevine nutrients

A Rochester Institute of Technology professor is helping to develop drone imaging systems aimed at empowering farmers to better manage the nutrients in their vineyards. Professor Jan van Aardt from the Chester F. Carlson Center for Imaging Science is receiving more than $357,000 in funding from the United States Department of Agriculture to help grape growers make data-driven nutrient-management decisions.

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Honors, Awards & Recognitions

Don Figer, professor and director of the Center for Detectors and lab assistant, Justin Gallagher, are featured in the January edition of the NASA Infrared Science Interest Group (IR SIG) newsletter with an update on Figer's "A Single Photon Counting and Photon Number Resolving Detector for NASA Missions" award.

Carols Lousto, professor in the School of Mathematical Sciences and co-director of the Center for Computational Relativity and Gravitation, was an invited speaker for the prestigious Chalonge - de Vega Lecture Series in Paris, France on January 21. His talk, "From simulations of binary black holes to insights into astrophysics and gravitational waves" was the opening presentation, followed by talks from five Nobel Laureates.

The Center for Computational Relativity and Gravitation group has been awarded allocations in the top US supercomputers for 2021 through the XSEDE Resource Allocations Service. Allocation of these resources represents a considerable investment by the National Science Foundation in advanced computer infrastructure for the United States. The estimated value of these awarded resources is $2,171,780.00.

Pratik Dholabhai, assistant professor in the School of Physics and Astronomy, received notice from the Scialog Review Committee that the Alfred P. Slone Foundation will provide funding in the amount of $55,000 to support the proposal “Investigation of the carbonation dynamics of synthetic silicates: guiding the development of net-negative production process and deployment in enhanced rock weathering." This is collaborative work on CO2 capture and sequestration with Rafael Santos (University of Guelph) and Andrea Hicks (University of Wisconsin Madison).

Matt Miri, associate professor in the School of Chemistry and Materials Science was an invited speaker at two conferences this past summer. At the fall meeting of the American Chemical Society, on August 18, 2020, his talk “How to Make Sustainable Polymers Marketable” was presented at a Symposium on Sustainable Green Chemistry: Bench to Market.

The second invited presentation, “Examples of More Sustainable Manufacturing with Emphasis on Polymer Production," was given to the members of the Board on Chemical Sciences and Technology (BCST) of the National Academy of Sciences (NAS), Medicine and Engineering on August 19, 2020 in the session “A Future for Sustainable Chemical Manufacturing." Miri served as an academic expert, while another speaker, Dr. Robert Maughon, Vice President, R & D, Sabic represented a major chemical company, and the third speaker, Dr. Jennifer Molnar, represented The Nature Conservancy. The three speakers answered questions by members of the board particularly on how to resolve issues with plastic pollution and had a very interesting and productive discussion.

A manuscript resulting from a collaboration between the Schmitthenner Molecular Imaging Lab at RIT and a group of cancer researchers at Memorial Sloan Kettering Cancer Center (MSKCC) has been published in the medical research journal, Theranostics. The cover of the journal features an illustration of a protein complex created using a dye synthesized at RIT to create a multi-modal imaging agent for cancer. The agent is based on combining fluorescence, photoacoustic imaging and positron emission tomography (PET).
The authors include three RIT chemistry alumni, **Jacky Lim** ’17, **Ryan Le Tourneau** ’17, and **Damien Dobson** ’19. With an impact factor of 8.6, Theranostics is an on-line, open access journal at the forefront of cancer research.

For the seventh consecutive year, Alla Bailey, principal lecturer, and Gerald Takacs, professor in the School of Chemistry and Materials Science, have received $25,000 from Constellation Energy, an Exelon Company, for their K-12 Clean Energy Education program. The program provides teachers with materials to incorporate experiments focused on fuel cell construction, electricity generation using a hydrogen fuel cell, solar electrolysis of water, and other topics into their curriculum.

Jaime Castillo, mental health therapist with Counseling and Psychological Services and embedded in College of Science, published two chapters in *Experiential Activities for Teaching Social Justice and Advocacy Competence in Counseling*, published by Routledge. The chapters, “Peer to peer ecological systems diagrams” and “Live discussion board to foster dialogue in white racial identity development,” provide counselor educators with innovative pedagogies to strengthen social justice advocacy in counselors-in-training.

College Updates

Changes to College Partners for University Advancement

In an effort to achieve new levels of success and to advance the university’s mission, the Division of Development and Alumni Relations, under its new leadership of Phil Castleberry, has gone through some changes which include a reorganization and renaming the Division. The Division became the *Division of University Advancement.* As a result of this reorganization, there will be some changes in our partnerships. Kevin Sackett, our Director of Development, will be moving into a new fundraising role as part of RIT’s Engineering Advancement Team (KGCOE and CET). Additionally, Tamra Werner, our Alumni Relations Director, will be moving into a new position within University Advancement. Please join me in thanking Kevin and Tamra and wishing them much success in their new role.

Moving forward, a three-person team will be put in place for COS: Mark Gaul (Senior Director), Tammy Arneth (Associate Director), and Bill Sachman (Director of Alumni Relations). **Mark**, as many of you know, previously worked in our college where he enjoyed many successful years. Most recently, Mark was Senior Director of Principal Gifts at RIT where he continued excellent development work. **Tammy** was previously a fundraiser at RIT where she focused on raising money at the leadership level. **Bill** has been a member of the Alumni Relations team since 2016, serving first as the Sr. Associate Director of Chapter Programs and most recently as the Director of Alumni Relations for the Saunders College of Business. Please join me in welcoming Mark, Tammy, and Bill to the College of Science advancement team. I am looking forward to working with them, and I am confident you will too.

In Memorium

The College of Science community is saddened by the passing of our former colleague and friend, Professor Emeritus **Dick Orr** who retired from the School of Mathematical Sciences in 2013 after 33 years of outstanding service. He passed away on January 14, 2021 after a shockingly fast battle with cancer. Dick was a highly-regarded and dedicated educator and a very good mathematician. His devotion to his students and his service to SMS and COS are well known. He will be greatly missed by all of us and by the many people whose lives he touched. To read more about Dick's legacy, see his obituary HERE.

Sponsored Research

Christopher Collison, SCMS, is the PI on a $63,478.00 grant from Hewlett-Packard Company to support a project titled “Photomechanical Self-Healing Intermediate Transfer Belts and Films.”

Emmett Ientilucci, CIS, is the PI with key personnel, Joseph Sirianni (CIS) on a $80,132.00 grant from Labsphere Inc. to support a project titled “Support to FLARE Project, Year 2.”

Joel Kastner, CIS, is the PI on a $70,909.00 grant from NASA to support a project titled “Nearby Young Stars and Disk Detective Citizen Science.”

Robert Kremens, CIS, is the PI on a $65,624.00 grant from DOD U.S. Army Materiel Command / Florida State University to support a project titled “The Role of Vorticity and Fuel Moisture on the Near-Field Plume Structure and Ember Dynamics.”

Paul Shipman, GSoLS, is the PI on a $45,000 grant from New Venture Fund to support a project titled “Public Interest Technology in Tribal Communities.”

Christy Tyler, GSoLS, is the PI on a $3,956.00 grant from National Oceanic and Atmospheric Administration / St. John Fisher College to support a project titled “Our Lakes, Streams, and Rivers: Experiential Education and Stewardship in the Lake Ontario Watershed.”

COS in the Media

NPR
Scientists Discover Outer Space Isn't Pitch-Black After All
NPR talks to **Michael Zemcov**, assistant professor in the School of Physics and Astronomy, about a new study on light outside of known galaxies.

Travel & Leisure
Scientists Just Discovered Outer Space Isn’t Pitch Black
Travel and Leisure mentions **Michael Zemcov**, assistant professor in the School of Physics and Astronomy, regarding a new study on light outside of known galaxies.

WHEC-TV
The odds of contracting COVID-19 at Thanksgiving
WHEC-TV talks to **Nathan Cahill**, associate professor in the School of Mathematical Sciences and director of the mathematical modeling Ph.D. program, about potential exposure to COVID-19.

WROC-TV
The giant Arecibo Telescope has been severely damaged; an interview with RIT professor about the major loss
WROC-TV talks to **Michael Lam**, assistant professor in the School of Physics and Astronomy, about his work with the second largest radio telescope in the world.

KPFA Letters and Politics
Covid Vaccine Differences and Reaching Herd Immunity
KPFA Letters and Politics hosts **Maureen Ferran**, associate professor in the Thomas H. Gosnell School of Life Sciences.

The New York Times
Outer Space Just Got a Little Brighter
The New York Times talks to Michael Zemcov, assistant professor in the School of Physics and Astronomy, about a new study on light outside of known galaxies.

CIO Magazine
Dell Technologies and TACC Fuel Great Innovations
CIO Magazine mentions Manuela Campanelli, professor in the School of Mathematical Sciences, and her work with the TACC Frontera supercomputer.

WXXI
Connections: Is Rochester becoming a hub for the field of textual

science?
WXXI's "Connections" program features **Roger Easton**, professor in the Chester F. Carlson Center for Imaging Science; **Lisa Enochs**, second-year student double majoring in motion picture science and imaging science; and **Zoë LaLena**, second-year imaging science student.

CNN
Coronavirus has been with us for a year. Here's what we still don't know.
CNN talks to **Maureen Ferran**, associate professor in the Thomas H. Gosnell School of Life Sciences, about the information that scientists still don't know about COVID-19.

Space.com
Scientists are getting closer in race to find gravitational wave background and dark matter
Space.com features work by **Sukanya Chakrabarti**, associate professor in the School of Physics and Astronomy.

The Poynter Institute
WHO did not say PCR tests grossly inflate positive test numbers
The Poynter Institute's PolitiFact talks to **Maureen Ferran**, associate professor in the Thomas H. Gosnell School of Life Sciences, about PCR COVID-19 tests.

Forbes
Say Goodbye To 2020 With The Year's Top 10 Hubble Photos
Forbes features work by **Joel Kastner**, professor in the Chester F. Carlson Center for Imaging Science and program faculty in the astrophysical sciences and technology graduate program, in its 10 most important Hubble photos from 2020.

WROC-TV
Asteroid or alien? RIT professor breaks down Harvard professor's claim
WROC-TV talks to **Michael Richmond**, professor in the School of Physics and Astronomy, about observing objects in space.

Rochester Beacon
RIT sponsored research hits another record high
Rochester Beacon interviews **Sophia Maggelakis**, Dean of the College of Science regarding recent research awards among College of Science Faculty, increasing RIT's visibility as a nationally significant science and engineering research center.

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