

## Dean's Message

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I am pleased to share with you my Mid-Academic Year Bulletin, which aims to inform you and give you an update on our initiatives, agenda items, progress towards meeting the goals and objectives of our college, and outline our successes. We have many accomplishments to celebrate in all areas, and I am very thankful for your dedication to our students and your contributions to the mission of our college and RIT.

Keep up the good work, everyone!

*~ Sophia Maggelakis, Dean, RIT College of Science*

## Updates

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### Phase II of the Strategic Plan

We have entered the second year and Phase II of our Strategic Plan. Below is a summary of the many initiatives that are underway.

- **Ph.D. program in Mathematical Modeling:** The concept paper for a new interdisciplinary Ph.D. program was shared with the RIT community and was approved by the Provost. We are now in the process of drafting the proposal.
- **B.S. in Integrated Sciences:** The concept paper for a new interdisciplinary B.S. program in Integrated Sciences was shared with the RIT community and has been submitted to the Provost for approval.
- **M.S. in Computational Finance:** The concept paper of a joint program (with Sanders College of Business and Golisano College of Computing and Information Sciences) in Computational Finance was shared with the RIT community and was approved by the Provost. We are now in the process of drafting the proposal.
- **Science and Math Education Center:** We established a new Center for Advancing Science/Math Teaching Learning and Evaluation (CASTLE). The center's mission is to improve science and mathematics education and outreach initiatives at RIT and foster collaboration between science and mathematics educators and researchers.
- **Materials Science and Engineering:** A SWOT analysis of our Materials Science and Engineering programs was conducted and is used to draft a strategic plan that will help us to enhance and grow our materials science and engineering academic and research programs.
- **Student Recruitment:** We are working towards developing a robust recruiting plan that can be used to increase our enrolments.
- **Fifth Annual Summer Math Institute:** We ran another successful Summer Math Institute with great speakers from industry and academia.

- **Science Exploration Program:** We developed a model for an interdisciplinary and experiential learning Science Exploration program. This program, directed by **Roger Dube**, has been a success. Last year's Science Exploration class was given the challenge of harnessing solar energy. During the course of the year, they invented a new type of microbial fuel cell that produces four times more power than anything published and are preparing a patent application.
- **Global Education:** We have established a task force led by **Mike Kotlarchyk** to develop a plan that will guide us on how to participate in the institute's efforts to expand our global education initiatives through exchange programs, 2+2 programs, international co-ops and other opportunities that will be a good fit with our college's strategic plan. This plan will be presented at the February Faculty and Staff meeting.
- **Space Plan:** We conducted a thorough audit of the space we currently occupy. This was used along with our strategic plan to devise our space plan, which was submitted to the Provost.

**Undergraduate Research:** Research by undergraduates is central to the mission of our college and our institute—combining faculty mentoring with student achievement to lead both groups to increased scholarship.

- We have two **NSF-funded REUs** (Research Experience for Undergraduates) awards.
- We ran the ***Undergraduate Research Seminar Series*** that promotes interdisciplinary collaboration. The series consists of one-hour sessions, that are usually scheduled on Wednesdays at 1 p.m., where faculty and students attend presentations given by COS undergraduate students.
- We supported, through fundraising activities, **twenty Summer Undergraduate Research Fellowships**.

**Hires in Targeted Areas:** We hired excellent faculty members in the following areas:

- Computational Mathematics
- Mathematical Biology
- Physics Education Research
- Remote Sensing
- Optics for Imaging
- Vision Science

**Research and Scholarship:** Our college has many successes to show in this area (See student, faculty, staff successes in the sections that follow).

- We had 372 total publication submissions to the Faculty Scholarship Report.
- Our sponsored research funding reached to \$10 million.
- Third Call of Dean's Research Initiation Grants (D-RIGS)

**Funding and Infrastructure:**

We:

- Balanced our budget!
- Got two Incremental tenure-track lines to support the new engineering programs (Chemical Engineering and Biomedical Engineering).

- Entered a multi-year phase-in plan for installing permanent air-conditioning in the Gosnell Hall. Temporary cooling was installed in parts of the building last summer and will continue to be provided until permanent cooling is installed.
- Received \$3 million to renovate chemistry teaching labs. The first phase has been completed and the labs will be used in the spring semester.
- Received \$600,000 to equip a chemistry lab in the Institute Hall.
- Updated calculus workshop (08-2154).
- Increased capacity of lab (08-1125).
- Converted a classroom (08-2305) to multi-use room for physics workshops.
- Renovated parts of the Chester F. Carlson building to provide research and office space for new hires.

## Initiatives

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**Academic Programs Under Consideration:** We are exploring ways to enrich our current curricula through the following:

- Include an experiential learning component (capstone, co-op, undergraduate research) in the curriculum of all science and mathematics majors
- Establishing a STEM Exploration program in collaboration with the Kate Gleason College of Engineering
- Developing double majors, more minors, more B.S./M.S. programs, advance certificates, and professional MS programs.

**Pre-freshmen Research Internships Program:** We are working in collaboration with the Enrolment Management and Career Services Office toward developing a program to attract students who are interested in working with our faculty on some challenging problems before they begin their studies as freshmen.

**Degree Programs Under Consideration:** We are working towards developing new degree program in the areas of:

- Biotechnology (M.S. program)
- Photonics (M.S. program)
- Data Science (M.S. program—a joint program between the School of Mathematical Sciences and Computer Science)
- M.S. in Physics
- Earth and Atmospheric Science (joint program with the Golisano Institute for Sustainability)

### Research Programs under Consideration

We are looking into strengthening a number of our emerging research programs such as:

- Modern Optics
- Bio + Sciences (biochemistry, bioimaging, bioinformatics, biomathematics, biophysics, biostatistics)

**Current Hires in Targeted Areas:** There nine faculty hires underway in the following targeted areas:

- Mathematical Biology
- Data Science
- Photonics
- Gravitational Wave Data Analysis
- Vision Science
- Biotechnology
- Color Science
- Detectors
- Materials Science

**Fundraising and Development Plan:** We achieved our full year fundraising attainment goal of \$1 million. Through December we raised just over \$1.1 million.

We developed a prioritized *Case for Support* for our college titled, *The Campaign for 21st Century Sciences*. The development plan has been shared with the upper administration and we are in the process of implementing it. We have reached this year's goal and are continuing to pursue our fundraising activities that will support:

- Renovation of the Gosnell Building
- Laboratory for Innovative, Collaborative, and Interdisciplinary Science (LICIS) to foster student research
- Research for Undergraduate Fellowships
- Faculty Development Fellowships
- WISe (Women in Science) Program
- Naming opportunities (for the college and schools within the college)
- Building extension

## News Items

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The College of Science welcomed two new school heads for Fall 2014, and hired a new communications manager.

- **Larry Buckley** was named Head of the Thomas H. Gosnell School of Life Sciences. Buckley, who joined RIT in 1998, has served as the associate head of the School of Life Sciences.
- **Mihail Barbosu** joined the university as Head of the School of Mathematical Sciences. Prior to RIT, he was the chair of the Department of Mathematics at The College at Brockport.

We are also working towards developing a College of Science brand, marketing techniques, and strategies—as well as redevelopment of our college website. We have hired a Manager for Marketing, Communications, and Recruitment, **Mark Gillespie**, who will lead this effort.

**STEP Grant Awarded to Project IMPRESS to Improve Retention of Deaf Students:**

RIT launched a \$900,000 National Science Foundation-funded program to improve the retention of deaf, hard-of-hearing, and first-generation undergraduates majoring in science, engineering, and computer science. Project IMPRESS (Integrating Metacognitive Processes and Research to Ensure Student Success), led by **Scott Franklin**, SoPA Professor and PI, along with **Elizabeth Hane**, GSOLS Associate Professor and co-PI, seeks to teach students self-reflection and self-assessment skills.

**Toyota Foundation Grant Expands Math Workshops:** The College of Science will expand its Summer Mathematics Institute Teachers' Workshop to three other universities through a \$120,000 grant from the Toyota USA Foundation. Toyota will support the 2014 workshop at RIT with \$20,000 and fund the now Toyota-branded math workshop at three universities. COS Dean **Sophia Maggelakis** and SMS Professor **David Ross** are PIs on the project. **Birgit Coffey**, SMS Lecturer, is co-PI.

**National Taiwan University Ranks RIT Physics in its Top 300 Worldwide Academic**

**Programs:** Taiwan University conducted its 2013 performance ranking of scientific papers from institutions around the world and listed RIT publications in the area of physics in its Top 300. The performance of RIT in scientific papers in physics ranks 293 in the world and eighty-ninth among US institutions. Physics is the only STEM subject at RIT that made the top 300 ranking.

**Sweetwater Energy Launches Science Co-op Program:** A collaboration between the GSOLS and Sweetwater Energy Inc. will give students a new avenue for co-operative education. Sweetwater Energy provides industry partners with a concentrated plant-sugar mixture for production of biofuels, biochemical, and bioplastics. Biochemist **André Hudson** and microbiologist **Michael Savka**, life sciences professors, work with students to characterize properties of the sugar-water mixtures that promote conversion to biofuels and other energy-related products.

**NSF Supports Extreme Black Hole Research With \$525,000 Grant:** The National Science Foundation has renewed its grant to the Gravitational Physics Program with a \$525,000 three-year grant. The funds will help advance the international effort to confirm the existence of gravitational waves and black holes, and anticipate the new field of gravitational wave astronomy through computer simulation. **Manuela Campanelli** and **Carlos Lousto**—fellows of the American Physical Society and founding members of RIT's Center for Computational Relativity and Gravitation—and **Yosef Zlochower** are known for one of the first simulations to merge two black holes on a supercomputer.

**LA Program “flips” mathematics classes through innovative teaching approaches:** The Introduction to Statistics, Multivariable Calculus, and Mathematical Modeling courses have an increased emphasis on collaborative learning, thanks to the addition of student Learning Assistants in their classrooms. The **LA program** is an institutionally- and externally-funded program designed to create new opportunities for student interactions during class and to increase the level of interest of undergraduate science and mathematics students in teaching.

## Celebrating Our Successes

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### Student Spotlight

**Rose Rustowicz** and **Malachi Schultz**, both second-year imaging science students, traveled to Hawaii to speak at two conferences. At the Hawaii University International Conference on Education and Technology, Rustowicz gave a talk titled “Student Initiated Project: Creating a Volumetric Display.” Schultz and Rustowicz also gave a presentation on “Using a Non-Traditional Pedagogy in STEM Disciplines: Implications for Faculty.” At the second conference,

the twenty-sixth International Conference on the First Year Experience, in Waikoloa, Schultz and Rustowicz gave a talk called “Putting the Capstone First: Turning the STEM Curriculum Upside-Down.”

Waste Management’s High Acres Landfill and Recycling Center, in partnership with Keep America Beautiful, has received \$4,000 to continue student research under the direction of GSOLS environmental science professors **Christy Tyler** and **John Waud**. Graduate and undergraduate students have been conducting research for the past three summers at High Acres Nature Area (HANA) in Perinton.

**Kim Kolb**, a CIS graduate student, attended the Scientific Detector Workshop on October 4 to share findings about an imaging system that could bring higher sensitivity and clearer vision to space missions. The technology was developed at Massachusetts Institute of Technology Lincoln Laboratory and advanced in partnership with the RIT Center for Detectors with funding from the Gordon and Betty Moore Foundation.

**Two Ph.D. students from CIS tied for first place** in a student paper award at the twenty-first Color and Imaging Conference in Albuquerque.

- **Adria Fores Herranz** was awarded for a paper, co-authored by Professor **James Ferwerda** on the perception of gloss in materials and on displays.
- **Yuta Asano** was awarded for a paper, co-authored by **Mark Fairchild** and **Laurent Blondé** of Technicolor in Rennes, on measuring variability in color vision using a four-primary display.

**Billy Vazquez, Kristina Punzi, and Carter-Thaxton “CT” Smith** did an astronomy presentation for fifty-three learning disabled children at Genesee Valley Partnership (formerly BOCES) in Mount Morris. The audience learned about sizes and locations of the planets—and how to find them in the night sky. The presentation also covered the Orion constellation and nebula.

Physics major **Adam Munich** won \$10,000 for his improvements to the Tesla coil, an alternating current electrical system. Munich was one of 450 undergraduates competing for the Engibous Prize at the Texas Instruments Analog Design Contest and Summit in Dallas.

Former physics major and 2013 RIT graduate **Hao Shi** was one of two winners of the American Physical Society’s \$5,000 LeRoy Apker Award for outstanding undergraduate research. As Shi’s nominating department, the School of Physics and Astronomy also received a certificate and \$5,000 to support undergraduate research. The APA presents two awards each year, one to a student from a Ph. D. granting institution and one to a student from a non-Ph. D. granting institution.

CIS Ph.D. student **Saugata Sinha** won Best Student Paper at the 2013 IEEE Western New York Image Processing Workshop held November 22 at RIT.

Astrophysics Ph.D. student **Valerie Rapson** was invited to join the American Astronomical Society Astronomy Ambassador program. Rapson conducts research on star and planet formation under her mentor and thesis adviser Joel Kastner, a leader in his field and professor in RIT’s Chester F. Carlson Center for Imaging Science and the School of Physics and Astronomy. Rapson was also elected to the Astronomy Section of the Rochester Academy of Science.

**Tessa DiDonato** was awarded an American Society for Microbiology Undergraduate Research Fellowship. The competitive undergraduate award is given to students interested in pursuing graduate careers in microbiology. Award recipients receive a stipend of up to \$4,000, a two-year student membership to the society and reimbursement for travel expenses to the 114th American Society for Microbiology General Meeting and the society's Capstone Institute in Boston.

**Thomas Kinsman**, a CIS Ph.D. student, won an RIT Innovator's Award for his work on "Object Recognition in Image Sequences." The technology has reached a significant milestone, generating \$75,000 in revenue from fiscal year 2008 through fiscal year 2013.

## Faculty Spotlight

**Brian Koberlein** and **David Meisel** take a "back-of-the-envelope" approach to astrophysics and computation in a textbook designed for undergraduate students. Koberlein, senior lecturer at RIT, and Meisel, distinguished professor at SUNY Geneseo, co-wrote ***Astrophysics through Computation***, published in June by Cambridge University Press.

**David Merritt** published ***Dynamics and Evolution of Galactic Nuclei***, with Princeton University Press. In the book, Merritt summarizes the theoretical work of the last three decades on the evolution of galactic nuclei, the formation of massive black holes, and the interaction between black holes and stars.

Professors **André Hudson** and **Michael Savka**, of GSOLS; **Han Ming Gan** '10 (biotechnology); and others published "Comparative genomic analysis of six bacteria belonging to the genus ***Novosphingobium***: Insights into marine adaptation, cell-cell signaling and bioremediation," in ***BioMed Central Genomics*** 2013.

Professor Emeritus **Marvin Gruber** published ***Matrix Algebra for Linear Models*** with John Wiley & Sons. The textbook is focused on matrix theory as applied to statistics along with related applications, particularly to the use and manipulation of data.

**David Messinger**, CIS professor; **Maria Busuiocanu** '13 (M.S., imaging science); and collaborators published "Compressive spectral imaging for accurate remote sensing" on the ***SPIE Remote Sensing*** web page on August 27.

**Jeff Lodge**, GSOLS Associate Professor, contributed to an article in ***Student Science*** titled "**Some Dirt Won't Hurt.**"

**Mark Fairchild**, associate dean and professor of color science was quoted in an ***Outdoor Photographer*** magazine article called "**Keeping it Real with HDR.**"

**Brian Koberlein** published an article on the science blog ***Universe Today*** titled "**Why Our Universe is not a Hologram.**"

CIS Professor **Navalgund Rao** has advanced the capability of photoacoustic imaging, a hybrid technique that combines light and ultrasound waves. His prototype imaging system focuses the waves through an acoustic lens that functions like an optical lens on a camera. The acoustic lens sharpens the contrast between normal and abnormal tissue for the early detection of prostate and thyroid cancers. Rao collaborates with Vikram Dogra, professor of radiology and urology in the University of Rochester Medical Center Department of Imaging Sciences. While Rao provided the technological solutions, Dogra focused on areas of need.

**Jie Qiao**, of the CIS, was invited to speak at the Optical Society of America's Minorities and Women Networking Reception in Orlando, Florida October 7 on the topic of "WiSTEE: Women in Science, Technology, Engineering, and Entrepreneurship." She also presented "WiSTEE

Connect” to close to a hundred international attendees at the Optical Society of America-Changchun Institute of Optics, Fine Mechanics and Physics Summer Session on Optical Engineering, Design and Manufacturing in Changchun, Jilin, China, on August 6. Qiao was also interviewed in the November issue of *Photonics*.

A new study by astronomers at NASA, Johns Hopkins University, and RIT confirms long-held suspicions about how stellar-mass black holes produce their highest-energy light. By analyzing a supercomputer simulation of gas flowing into a black hole, the team finds it can reproduce a range of important X-ray features long observed in active black holes. **Scott Noble**, associate research scientist at CCRG, was a member of the research team. He developed a computer simulation solving all of the equations governing the complex motion of inflowing gas and its associated magnetic fields near an accreting black hole.

**Manuela Campanelli**, director of CCRG, spoke at the 27th Texas Symposium on Relativistic Astrophysics, held at the University of Texas at Dallas December 8–13. She joined other leading scientists in the field, including Nobel Prize–winners Joseph Taylor, from Princeton University, and Steven Weinberg, from the University of Texas at Austin.

**Anthony Vodacek**, associate professor at the Chester F. Carlson Center for Imaging Science, along with **Brian Tomaszewski**, assistant professor of information sciences and technology, are conducting a pilot study in Rwanda where teenagers there are mapping their communities using smartphones and tablet computers.

**David Merritt**, of SoPA, traveled to Europe on an eight-week leave of absence to participate in the GRAVASCO Trimestre at the Institut Henri Poincaré in Paris. Merritt gave a total of nine hours of lectures on the topic of galactic nuclei to the visiting graduate students. Also in Paris, Merritt gave a seminar at the Institut d’Astrophysique de Paris, and a conference talk at a weeklong **workshop** (“Dynamics and Kinetic Theory of Self-Gravitating Systems”) held at the IHP in conjunction with the Trimestre.

**Mishkat Bhattacharya**, SoPA assistant professor, presented “Ray transfer matrix for a spiral phase plate” at the Optical Society of America meeting on October 8 in Orlando, Florida.

**Nathan Cahill**, associate professor in SMS, and **Raymond Ptucha**, adjunct professor of computer engineering, presented at the International Conference on Image Processing in Melbourne, Australia, September 15–18. They both won the “Top 10% Papers Award,” according to reviewer scores and recommendations. Cahill is also the recipient of a \$150,000 NIH grant to conduct a longitudinal study of lung cancer of which Cahill and Marc Niethammer of the University of North Carolina are named principal investigators. The grant is a Phase I STTR working with the company Kitware and radiologists at the University of Pittsburgh.

An NSF grant has been awarded to chemistry professor **Kalathur Santhanam** and mechanical engineering professor **Satish Kandlikar** for a project entitled “Ultra high boiling performance on nano/microstructured surfaces through electrodeposition of copper and graphene.”

The International Colour Association has recognized **Roy Berns** with the Deane B. Judd Award for a lifetime of outstanding contributions to the field of color science. Berns is the Richard S. Hunter Professor in Color Science, Appearance and Technology, in the Munsell Color Science Laboratory. He was nominated by the US Inter-Society Color Council. Berns accepted the medal at the International Colour Association’s 12th Congress in New Castle on Tyne, England. He delivered the Judd lecture on new approaches for color scientists to communicate with visual artists.



**David Messinger**, of CIS, was invited to join the editorial board for *Optical Engineering*, the journal of the International Society for Optics and Photonics, or SPIE, which publishes peer-reviewed papers reporting on research and development in optical science and engineering. Messinger will serve as an associate editor for Optical Engineering in the area of spectral and polarimetric imaging.

Professor **María Helguera** of CIS was appointed to the Wedd Visiting Professor Chair at the University of Rochester Medical Center Department of Pharmacology and Physiology while on a yearlong sabbatical. She began her new position on July 1. Helguera will also implement a high-frequency ultrasound setup to investigate the mechanical properties of artificial tissues using Spatially Modulated Ultrasound Radiation Force.

The following College of Science faculty members have been nominated for RIT's Non-Tenure Track Teaching Award to be given May 14:

- **Alla Bailey**, SCMS
- **Carol Oehlbeck**, SMS
- **Hans Schmittener**, SCMS
- **Connie Shannon**, SMS
- **Gregory Trayling**, SoPA
- **Olga Tsukernik**, SMS
- **Eric West**, SoPA

**Sandi Connelly**, of GSOLS, received a Provost's Learning Innovation Grant for a project entitled "Implementing the Flipped Class Model to Engage All Students in a Large General Education Biology Course."

**Joshua Faber**, of the Center for Computational Relativity and Gravitation, has been nominated to be a member-at-large of the Topical Group in Gravitation of the American Physical Society.

Two researchers from the Science and Mathematics Education Research Collaborative, or SMERC, were among twenty-five in their field to be invited to the University of Colorado Denver to share their findings at a November 8 networking meeting. **Dina Newman** and **Kate Wright**, of GSOLS, joined fellow biology education researchers to discuss approaches that promote learning in introductory biology classes. Resources shared at the meeting, including reading lists, activities, assessments, and other materials, will be compiled on a website that will also offer guidance on future projects.

## Events

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**WXXI and RIT Mark 75th Anniversary of Xerography:** Seventy-five years ago, Chester F. Carlson invented the process of dry photocopying known as electrophotography. The innovation led to the creation of the automatic photocopier and the company known as Xerox. The Chester F. Carlson Center for Imaging Science celebrated this invention with a special seminar event and screening of the WXXI documentary *The Invention No One Wanted* on October 23. The film, produced in 1988, explores Carlson's career and the sociological impact of his invention.

**RIT and Little Theatre Team Up for Three-Part Science and Film Series:** RIT and the Little Theatre teamed up for a three-part series exploring the connection between science and film with the screening of the 1984 Japanese animated post-apocalyptic fantasy film, *Nausicaä of the Valley of the Wind*. The November 14 showing was followed by a discussion co-led by Callie Babbitt, assistant professor at the Golisano Institute for Sustainability, and Greg Babbitt, professor of biology and computational genomics in the College of Science.

**Cahill chairs Western New York Image Processing Workshop:** **Nathan Cahill**, associate professor in the School of Mathematical Sciences, chaired the Western New York Image Processing Workshop at RIT on November 22. Highlights included a keynote lecture on forensic bitemark comparisons by H. David Sheets of Canisius College and a lesson in searching for people in images by alumnus Andrew Gallagher '00 (MS, electrical engineering) of Cornell University. Kyros Kutulakos, from the University of Toronto, also presented a talk on “Imaging Less than Meets the Eye.”

**Light field camera inventor named to the Imaging Hall of Fame:** **Ren Ng**, inventor of the light field camera, was inducted into the Imaging Hall of Fame at CIS December 11. Ng is the founder and Executive Chairman of Lytro, the first company to produce and market a light field camera for consumer. By characterizing both the color and intensity of light rays from a subject and also their direction, these cameras allow a photographer to focus digital images after they have been taken. With his hall of fame membership, Ng joins LCD display pioneer George Heilmeyer and German physicist August Toepler, the first scientist to visualize acoustic waves in air. The keynote speaker for the induction ceremony was Steven Koonin, former Undersecretary of Energy for Science and current director of the Center for Urban Science and Progress at New York University.

### Other items

- For the annual **Imagine RIT** public open house event, the College of Science hosted a nanomaterials booth organized by students and faculty in the School of Chemistry and Materials Science. The exhibit included hands-on demonstrations of futuristic materials including memory metal, temperature-sensitive LCDs, and RIT-designed nanocomposites.
- **Women in Science (WiSe)** held a Graduate School Boot Camp to assist with personal essays, forms, and other materials required in graduate school applications.
- **The RIT Observatory** held open houses during the fall semester. On September 13, visitors gazed at the first quarter moon and globular cluster M13—as well as Saturn, Uranus, and several artificial satellites. On December 13, visitors viewed the gibbous moon, Jupiter, and the Orion Nebula.
- **The Fourth Annual Astrophysical Sciences and Technology Research Talks Jamboree** was held on November 1. AST graduate students presented progress reports on and highlights from their research projects over the past year.
- **The COS Faculty Research Symposium** was held September 9. This annual event is held early in the fall semester to encourage faculty members to share research in an informal setting. There were forty speakers in two sessions, each speaker giving a three-minute presentation with a single slide. Speakers this year included those receiving FEAD and D-RIG internal grants in preceding years, those returning from sabbaticals, and directors of major COS research laboratories. A few volunteers gave presentations as well.

## Speakers

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### Distinguished Speaker Series

The promise and practice of biomedical optics was the focus of a talk by **Mary-Ann Mycek**, professor of biomedical engineering at the University of Michigan College of Engineering and the School of Medicine. She presented “Biomedical Optics—Shining Light on Clinical Medicine” October 10 as part of the Distinguished Speaker Series. Her lecture included an overview of the medical research and technological advances behind biomedical optics for clinical diagnostics.

**Steven Squyres**, the James A. Weeks Professor of Physical Sciences at Cornell University, presented “Roving Mars: Spirit, Opportunity and the Exploration of the Red Planet.” Squyres provided a summary of the missions of twin robotic explorers Spirit and Opportunity, from their initial conception through their development, launch, landing and operations on the surface of Mars.

Independent researcher **David Searls** presented “Molecules, Languages, and Automata” December 5. Searls adopts a syntactical view to pattern matching and searching through the genes and other modules in DNA sequences and building predictive algorithms based on grammatical approaches to the expression of structures in RNA.

### Alumni

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**Bethany Choate** and **Matthew Heimbueger**, both 2006 imaging science graduates, are building their own sustainable home on 28 acres in the Rochester suburb of Rush. Choate is presently the senior marketing specialist for the Chester F. Carlson Center for Imaging Science; Heimbueger is senior laboratory engineer at the University of Rochester laser energetics laboratory.

**Andrew Robak takes a closer look at a popular nail art trend:** When a family member suffered a chemical burn as a result of applying fake gold leaf to her manicure, Andrew Robak, a 2002 RIT graduate and associate professor of chemistry at Keuka College, was asked to explore why. Robak concluded that the tin found in the gold leaf acted as a catalyst when it came in contact with the nail glue. Typically, nail glue reacts and dries when it comes in contact with water vapor in the air. This drying process is the nail glue changing from liquid form to solid form. When almost equal amounts of gold leaf and nail glue come in contact, the drying process is sped up greatly, causing excess heat and often smoke as a result. The experiment was featured in the summer 2013 issue of *Tipsy*, a nail fashion magazine.