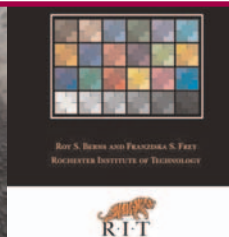


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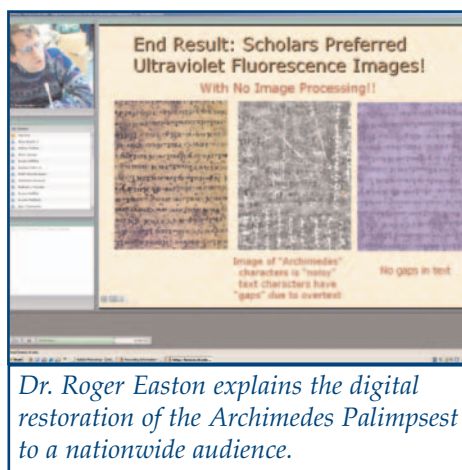
The Newsletter of the Chester F. Carlson Center for Imaging Science

Fall 2005, Issue 12

CIS Outreach Goes Nationwide

In an effort to raise awareness of imaging science among prospective students, the Center for Imaging Science has gone high-tech. This October CIS began hosting live online lectures targeted specifically at high school students and their teachers.

The idea behind the web-based events was born this spring as a result of an online "mini-course" Associate Director Joe Pow taught to an advanced placement physics class in Trumansburg, NY. This week-long course on the basics of digital image processing made use of a system known as "Breeze," which is a Macromedia product designed to facilitate distance learning. "Our faculty had been using Breeze for our online Masters' program," Pow said. "But this was the first time anyone in CIS, or RIT for that matter, had used it specifically to reach out to high school students." The results were overwhelmingly positive. Chris Bond, a physics teacher at



Dr. Roger Easton explains the digital restoration of the Archimedes Palimpsest to a nationwide audience.

Trumansburg High School said, "It was a great success from my perspective as a teacher. My students were engaged and really took to the remote instruction and activities." As a result of the positive experience with Trumansburg, Pow realized that

this technology had incredible potential to reach an even wider audience. During the summer he started making plans for a series of web-based talks for prospective students around the country.

The first hurdle was to decide who should give the talk and what it should cover. Fortunately, at about the same time CIS alumnus David Bretz, an imaging scientist working for NASA's Johnson Spaceflight Center in Houston, contacted the Center to ask if any of our students would be interested in hearing about his work during the recent mission of the space shuttle Discovery. "His timing couldn't have been better," Pow said. "The subject material was fascinating, and the fact that we could link up with Dave remotely from

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Imaging Helps Enhance Homeland Security

RIT Partners with Leader in Remote Sensing to Enhance Homeland Security. Leica Geosystems will create a Center of Excellence for research and development. Leica Geosystems, a world wide leader in geospatial imaging, has recently chosen the Carlson Center for Imaging Science at Rochester Institute of Technology to serve as a Center of Excellence in

Photogrammetry and Remote Sensing. The award includes a substantial donation of software and technical support.

"We are looking forward to this partnership with RIT," said Bob Morris, President of Leica. "The Center of Excellence at RIT will serve as a testing ground for our new

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CEO of Pictometry International Corporation Named CIS Advisory Board Chair

Dick Kaplan says he was a bit surprised to be asked to serve on the advisory board of the Chester F. Carlson Center for Imaging Science.

"I'm not a technical person," says Kaplan, the board's new chair. "But they said they wanted someone with business background, so I said OK."

Kaplan is CEO of Pictometry International Corp., a rapidly growing imaging science company.

Pictometry's patented information system combines aerial imaging with a state-of-the-art software system to provide full color, high resolution digital images of the world.

The system was developed by Steve Schultz '89 (computer science), the man Kaplan refers to as "the real genius" behind Pictometry. Although the technology was promising, "there was no product, and no market" when potential investors asked Kaplan to take a look in 2000.

"I think imaging science is going to be a huge growth field in the future."

Kaplan came out of retirement to help bring the company to life. He has led a variety of businesses, serving as chairman and co-founder of Resnick Media Associates Inc., an advertising and marketing agency; and Blanton Communications Inc., a computer software company. Kaplan was president of RAK Realty Corp., a real estate development company and was chairman and founder of WorkSmart International Inc., a human resource development, publishing and training company for multi-market, multinational corporations and organizations.



The combination of Kaplan's business experience and the unique technology paid off. The company's growth, on average, has doubled every year for the past four years. Pictometry has grown from five employees in 2000 to more than 90 today – including many RIT graduates. Customers include 125 counties, the states of Massachusetts and Rhode Island, federal government organizations and private businesses. Major metropolitan areas using Pictometry include Atlanta, Baltimore, Boston, Indianapolis, Los Angeles, New York City, Philadelphia, San Francisco, and Washington, D.C.

"The technology is of great value to any organization that needs detailed photos of land sites," says Kaplan. Among the company's clients are emergency responders, real estate planners and developers, assessors, engineering firms, law enforcement, insurance companies and transportation agencies.

Kaplan sees a promising future for his company – and, indeed, for this industry.

"I think imaging science is going to be a huge growth field in the future."

For more information, go to www.pictometry.com.

Former RIT Dean Will Be Missed

Robert Johnston, a former dean at Rochester Institute of Technology, died Oct. 19 at age 77. Dr. Johnston, an archaeologist, also conducted imaging science research, working on ancient documents that included a medieval copy of an ancient text by Archimedes, the Greek mathematician, and the Dead Sea Scrolls.

Dr. Johnston had a long career at RIT, starting in 1970 as dean of the College of Fine and Applied Arts, where he served for nearly 20 years. He later served as director of the Chester Carlson Center for Imaging Science.

His work in imaging restoration of the Dead Sea Scrolls was in collaboration with Xerox Corp. and Eastman Kodak Co. He also worked to recover the text from five sample pages of the Archimedes Palimpsest, the 10th century Byzantine manuscript that sold for \$2 million in 1998 at Christie's auction house in New York City. The manuscript is the earliest transcription of the Greek mathematician's writings and the only known source of his "Method of Mechanical Theorems," which combined mathematics and physics.

"It's another opportunity to apply imaging science technology to reveal ancient documents that would be lost without it," Johnston said a 2000 interview.



Dr. Johnston is survived by his wife, Louise E.; daughters, Vickie M. (Michael) Roberts, and Tara A. DuMont; and 4 grandchildren.

RIT Team Promotes the Return of Otters to Western New York

Scientists at RIT are helping to promote the return of the river otter to Western New York. Otters, which once lived naturally in this area, were wiped out about 100 years ago due to water pollution, habitat loss, hunting and trapping.

Lei Lani Stelle, assistant professor of biological sciences, Robert Kremens, senior research scientist at the Carlson Center for Imaging Science and a group of a dozen students are studying the success of the New York River Otter Project that reintroduced 279 otters from the Adirondack and Catskill mountains to 15 sites, including local creeks. The relocation was completed by 2000. Stelle and her team are working with the Department of Environmental Conservation and the Seneca Park Zoo to track the project's success.

The researchers are conducting fieldwork to monitor how well the population has established itself through breeding, dispersing and setting up a home range. Fecal



Marigold Bethany, a fourth year Biology student, is testing out a camera box to attempt and spy on the local river otters.

samples are collected and later analyzed for information about the otters' diet and energy needs. A graduate student in Stelle's lab is also working to extract DNA material that could genetically fingerprint individual animals, making them easier to track in the future.

In addition, the team is collaborating with Kremens to utilize

imaging equipment from the Carlson Center to record otter activity and behavior. The system is also being used in Stelle's concurrent research project studying river otters in British Columbia, allowing scientists to compare the two otter populations and their different habits.

CIS Alumni Joins Advisory Board Donna Rankin-Parobek '92

Donna Rankin-Parobek, a 1992 BS/MS imaging science grad, has joined the CIS Advisory Board.

For the past four years, Rankin-Parobek is intellectual property manager in the Medical Science Technology Center for Eastman Kodak Co. She previously worked in Kodak's Commercial and Government Systems for six years.

"The intellectual property work fits me very well, and my technical background is useful," says Rankin-Parobek, "It's interesting because I get to see the wide range of technology people are working on, and licensing of technology is becoming such an important part of



what the company does."

Rankin-Parobek started at RIT as an electrical engineering major, but changed to imaging science on the first day of her sophomore year. That same year, she began working with

John Schott in remote sensing. That work helped prepare her for a job in research at Kodak.

She has remained connected with RIT, arranging tours for the CIS high school interns and making presentations about imaging science to her alma matter, Tioga Central High School.

Rankin-Parobek's husband, Christopher Parobek, a 1992 RIT graduate (electrical engineering), is a software engineer at Ortho Clinical, Diagnostics. The two met playing volleyball at RIT. They have two daughters, ages 10 and 7.

Famed Painting by Color Master Faber Birren Comes to Munsell Color Science Laboratory

Scientists will use artwork to advance the study of color science and digital reproduction

One of the most important works by Faber Birren, among the world's leading authorities on the study of color, has been donated to the Munsell Color Science Laboratory at RIT.

The painting, *Untitled* (1976), was created by Birren to illustrate the rendering of various illumination effects by an artist. It is of significant historical interest in the field of color science and has been the subject of studies by scientists and artists over the years, beginning with a 1977 publication in the leading color science journal, *Color Research and Application*.

"This painting has tremendous value both as a teaching tool and as a means for further research in the field," says professor Mark Fairchild, director of the Munsell Lab. "One of our major areas of study is the digital reproduction of artwork, and Birren's piece will be invaluable in helping us develop better imaging systems."

The painting was donated by Mr. and Mrs. Allan Wittman of Valley Stream, NY and is already being used in classes and research projects at the lab.

Faber Birren was the author of more than 40 books and articles in the field of color as well as the creator of



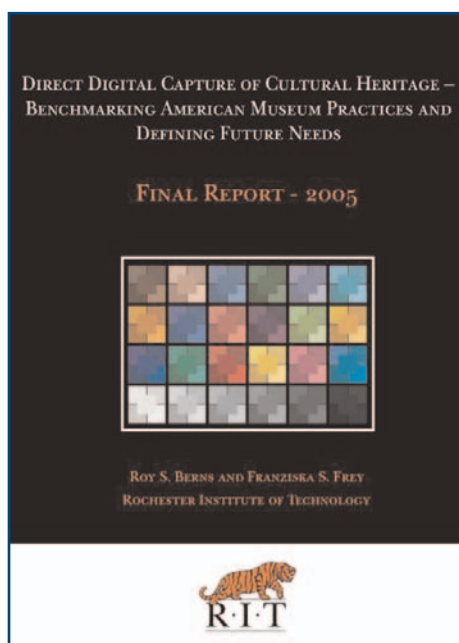
Yale University's prestigious book collection on the study of color, now named the Faber Birren Collection.

Mellon Digital Camera Benchmarking Project Completed

RIT scientists have released the first comprehensive report detailing the quality of the digital images being produced by American museums, libraries and other cultural-heritage institutions.

Roy Berns, the R. S. Hunter Professor in Color Science, Appearance and Technology, and Franziska Frey, assistant professor in the School of Print Media, led a two-year study that included a comprehensive survey of museum practices, a full scientific evaluation of digital practices at several institutions and the development of a national conference to discuss the state of digital imaging and roadblocks to move forward. Their study provides new insight into the use and quality of digital imaging by American museums to catalog and market their collections.

"Digital imagery is increasingly becoming the main medium for



accessing American artwork," Berns says. "These digital surrogates are used by scholars and students alike. Our goal is to help create imagery of the highest possible quality."

Previously, most museums used film photography to capture images of their artwork for publication in art history texts, magazines, posters, and promotional materials. Many institutions are now moving to digital imaging.

"Digital imaging is still in its infancy and there is a lack of experience and knowledge in how to produce the best images," Berns adds. "Our research will hopefully provide a standardized process and a better understanding of what a quality image should look like."

Berns' and Frey's study was principally funded by the Andrew W. Mellon Foundation. They hope to use their findings to promote the use of measurable tests and stricter protocols in digital image production. The full report is available at www.cis.rit.edu/museumSurvey/.

Homeland Security

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products and leverage the expertise of the research staff, students and faculty through the broad range of imaging and remote sensing projects in which they are involved."

The Center of Excellence will be integrated into the Laboratory for Imaging Algorithms and Systems, a research group within the Center for Imaging Science. The lab is currently partnering with the Monroe County Office of Emergency Preparedness and the National Geospatial-Intelligence Agency to provide more accurate mapping and location technologies to be used during possible terrorist attacks or national emergencies.

In addition, the lab will be utilizing the center as part of its Wildfire Airborne Sensor research program with NASA and the U.S. Forest Service. This effort uses high performance sensor technology and software to track and map forest fires to assist the forest service and firefighters in identifying fires earlier and helping to ensure the safety of crews on the ground.

The wildfire team recently mapped a series of forest fires for the U.S. Forest Service in Western Montana.

"RIT is very proud to be chosen as a Leica Center of Excellence," added Stefi Baum, director of the Center for Imaging Science. "We plan to use this software donation to enhance our efforts in remote sensing both as an academic and research tool."

The Laboratory for Imaging Algorithms and Systems is focused on the development of prototype sensors and software for observation of the earth using aerial and satellite-based imaging systems. The main areas of the lab's research are the development of image exploitation tools, airborne and ground based sensor systems, and decision support tools for incident managers.

The wildfire research program was initiated with federal support



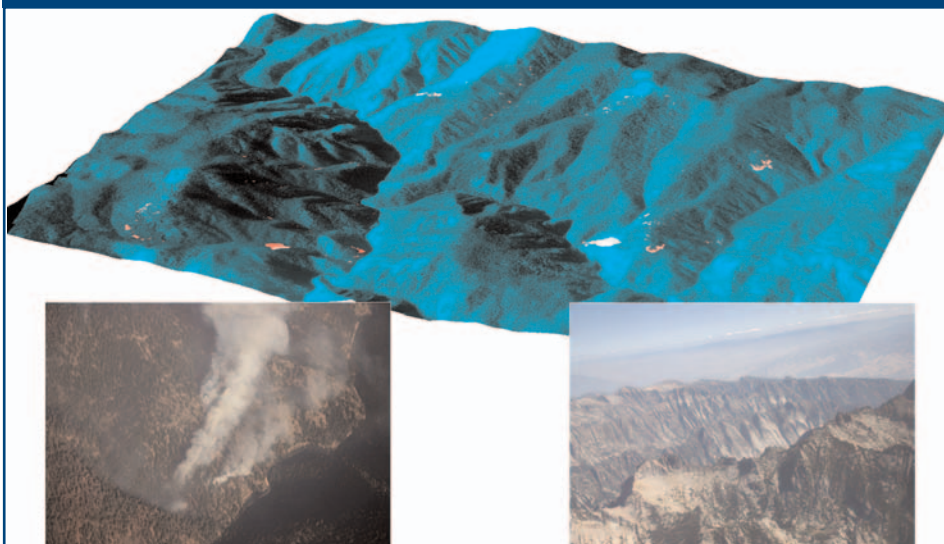
RIT's WASP Flight Crew: Carl Levinson-Landcare Aviation, Jason Faulring-RIT and Simon Freitas-Landcare Aviation.

secured by Congressman James Walsh (R-Onondaga). The federal funds have enabled the RIT lab to significantly enhance its development of sensor technology and its applications in a wide range of uses.



Leica Geosystems, Brad Skelton hands RIT Provost McKenzie a plaque designating CIS as a Leica Center of Excellence for Photogrammetry and Remote Sensing.

Selway-Salmon Wildfire Use Complex - Beaver Jack Fire



The above topographical image was created using the LIAS technologies; the reddish bright areas indicate fire. The other images were taken from a handheld camera aboard the wildfire flight expedition.

The research has also spawned collaboration with a local company, Geospatial Systems Inc, which is commercializing a new imaging product based on the technology.

The Center of Excellence program developed by Leica Geosystems was conceived to foster collaboration with a small group of outstanding academic institutions, bound together by a commitment to advance concepts, technology and expertise, which leverage image-based spatial data. The workflows and case studies developed using the Leica Geosystems products in class settings, demonstrations and projects will provide new research and development in the field and prepare the nation's next generation of imaging scientists.

CIS Nationwide

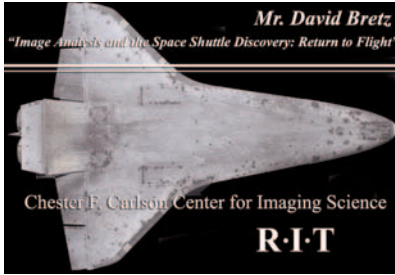
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Houston made it all the more attractive." The two began planning for an October presentation.

Once the date and subject were settled, the next challenge was publicizing the event. Here CIS teamed with the RIT Office of Undergraduate Admissions to get the word out. Tapping into the RIT database of student inquiries, a total of more than 4500 postcard invitations were sent to prospects who indicated an interest in science, math, or computers. According to Pow, "We have a lot of prospective students come through here over the course of the year, but the only way we'd get the numbers we were hoping for with the web event was to team with Admissions. We couldn't do it without them."

Students receiving the invitations were directed to a web site specifically set up to register attendees for the online talk. Once their contact information was submitted, the student received an e-mail with a link which would give them access to the Breeze system on the night of the event. All they needed to participate was a web browser and a high speed internet connection.

The first online talk, featuring CIS alumnus David Bretz, went off without a hitch. After logging in,



students entered an online "meeting room" which enabled them to see and hear the presenter, as well as any visual aids being used. They also had access to a "chat box" through which they could ask questions to the speaker. As the "host" for the event, Pow was in control of the entire session. "I was watching the list of attendees as the 'meeting room' started filling up, so I knew we had a good turn out. I didn't realize just how good though until after the talk when I received an e-mail from a teacher in San Antonio telling me that he was watching along with a group of 50 of his students!"

Those who did attend this inaugural event were treated to an outstanding talk by Bretz which featured unique imagery from the Discovery mission to the International Space Station in July. His talk prompted lively discussion among the students in the audience, as evidenced by their comments in the chat box.

Immediately after Bretz's successful talk plans began for the next web event. For that one, Dr. Roger Easton offered to give a

summary of his work on the restoration of the Archimedes Palimpsest, a 10th Century document which contains the oldest known transcriptions of the works of the ancient Greek mathematician and scientist. Easton's talk, which took place in November, attracted as many students as the October event. This one also featured a special greeting and program overview by Dr. Stefi Baum, Director of the Center for Imaging Science.

"There's an extra added benefit we get from using Breeze to conduct these events," Pow said. "Each one of the sessions is recorded for later use. Anyone with the web address can watch the entire presentation as if it was live. This allows us to link the recordings of the events to the CIS web page so that any visitor can view them, or we can call them up at a later date for special occasions. We've already shown Dave Bretz's talk at one of our student IS&T meetings."

Pow sees potentially unlimited applications for the Breeze technology. "It's obviously proven to be a powerful tool for outreach to prospective students. But there's no reason why we couldn't use it just as effectively to reach out to corporate partners. We're actually thinking about putting together a Breeze-based virtual tour of the Center for anybody who'd like to know more about us. The sky's the limit."

Imaging Connection is produced by a team of dedicated employees who work with CIS faculty, staff, and students to make this publication possible. Please send comments to managing editor, Colleen M. Desimone at: desimone@cis.rit.edu or call 585-475-6783. **Newsletter Team Members:** Colleen Desimone, Stefi Baum, Joe Pow, Susan Murphy, Kathy Lindsley and Will Dube. **Electronic Copies can be found at:** www.cis.rit.edu

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