Information Technology

Annual Report

2011 - 2012

University of Rochester

Information Technology

Table of Contents:

David E. Lewis

Vice President for
Information Technology and
Chief Information Officer

As our fifth Annual Report exemplifies, information technology continues to play an important role in advancing the University's strategic priorities.

The Health Sciences Center for Computational Innovation became one of the five most powerful academic supercomputing sites in the United States when we received an IBM Blue Gene/Q supercomputer in July. Our leadership in high performance computing is not just about making the latest technology available to our community—it's about connecting researchers with computational scientists, fostering collaboration between scientists from different fields of study, and bridging academia with industry and government agencies. Building on our partnership with IBM and New York State, we will continue to grow our high performance computing resources and expertise to help researchers tackle bigger, more complex problems.

Not only is the use of technology revolutionizing research, but it is also transforming health care. Electronic medical records have been successfully implemented at 95 percent of the Medical Center, including Strong Memorial Hospital, Highland Hospital, and all 162 ambulatory sites. This system unites the Medical Center's regional facilities and improves patient care.

As the University invests in new facilities, both physical and virtual, IT will be a key enabler. In the construction of a new residence hall, digital media center, and children's hospital, we seek to address current and expected IT demands by building technology into the designs from the ground up. And over the coming year, the University will also conduct a broad review of online education.

The University's IT needs are constantly changing, and we will continue to evolve and adapt to meet them. I look forward to the year ahead.

Meliora!

New York State Senator **Joe Robach**, University of Rochester President **Joel Seligman**, New York Governor **Andrew Cuomo**, NYS Assemblyman **Harry Bronson**, and NYS Senator **Jim Alesi** cut the ribbon to unveil the Blue Gene/Q—one of the world's most powerful supercomputers for health research—on August 3, 2012.

University Inaugurates New Era of Health Care Research

The Health Sciences Center for Computational Innovation (HSCCI) became one of the five most powerful university-based supercomputing sites in the nation this summer when it received a Blue Gene/Q, IBM's next generation supercomputer. Dedicated to applying cutting-edge computational power to solve health care's most complex problems, HSCCI is the result of a partnership between the University, IBM, and New York State.

"This is an important step toward the creation of a resource that will make Rochester an international center for biomedical research and a magnet for research funding, scientific minds, industry and academic collaboration, and private sector job growth," said University President Joel Seligman.

Renovations to the University's primary data center and acquisition of the Blue Gene/Q were made possible through a $5-million award from New York State at the recommendation of the Finger Lakes Regional Economic Development Council. Last year, the council identified HSCCI as a priority project. The Center for Governmental Research estimates that HSCCI could create 900 jobs in the community and generate $205 million in new research funding over the next ten years. The Center is also expected to bring $50 million in economic benefits to the region.

"With this partnership, New York has an unprecedented opportunity to participate in cutting-edge healthcare research while creating hundreds of jobs at the University and in the Finger Lakes region," said New York State Governor Andrew Cuomo.

"The collaboration between state government, academia, and the private sector in Rochester shows the remarkable progress that can be accomplished through the innovative partnerships we are developing," said Lt. Governor Robert Duffy.

Access to computer systems that have the ability to analyze vast quantities of data—a challenge commonly referred to as "big data"—is widely viewed as one of the keys to advancing medical knowledge and innovation. Decades of scientific breakthroughs and the accumulation of highly detailed demographic information simultaneously represent an opportunity and a barrier to research. This wealth of information holds the potential to give scientists heretofore unprecedented insight into human health. However, in many instances, efforts to interpret this data have been frustrated by the absence of computing resources or software tools powerful enough to fully analyze the mountains of data.

"With this partnership, New York has an unprecedented opportunity to participate in cutting-edge healthcare research while creating hundreds of jobs at the University and in the Finger Lakes region."

Andrew Cuomo
New York State Governor

"We need very powerful computational resources, not only storage to hold the data, but also the tools and hardware to analyze all the data," said David Topham, Ph.D., a Medical Center microbiologist and executive director of HSCCI. "High performance computing holds the potential to revolutionize the way we study, monitor, and treat diseases."

The Blue Gene/Q is 15 times more powerful and 4.5 times more power efficient than its predecessor, the Blue Gene/P, which the University received in 2009. It has a peak performance of 209 teraflops—meaning it can make 209 trillion calculations per second—and has 400 terabytes of storage.

Continued on page 4

Continued from page 3

At the same time, the Blue Gene/Q is one of the world's most energy-efficient supercomputers, with the University tied for third on the Green500 list. It uses 90 percent water cooling to directly cool the 1,024 compute nodes, reducing both energy use and floor space needs.

"High performance computing holds the potential to revolutionize the way we study, monitor, and treat diseases."

David Topham, Ph.D.
Executive Director of HSCCI

With new high performance computing resources in place, HSCCI has identified three key research domains as the focus of its efforts: (1) modeling complex biological systems and the integration of big data, (2) biomedical imaging, and (3) molecular and fluid dynamics. The center will also explore how to use electronic medical records to assess healthcare outcomes, improve treatments, reduce costs, and perform virtual clinical studies and trials.

"I have a favorite phrase; it's turning data into knowledge. I think that's what the center is all about, creating the knowledge that we can use to improve health care, improve treatment of infectious disease, improve treatment of traumatic brain injury, and bring down the cost of health care," Topham said. ■

Data Center Construction

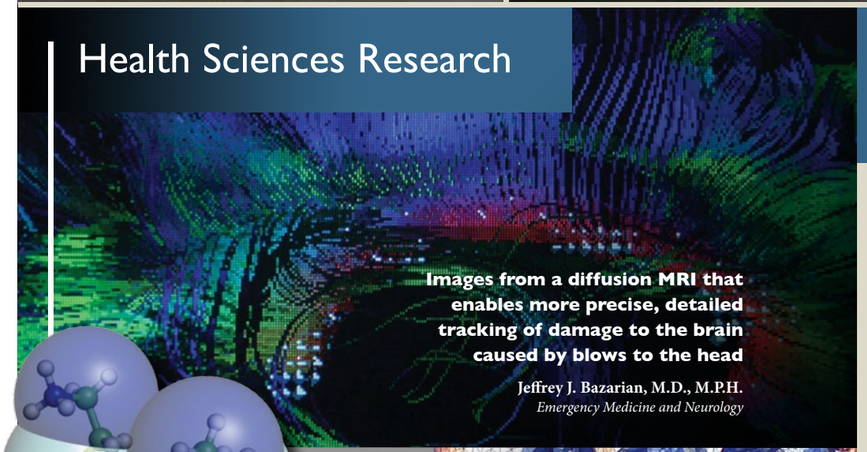
Future research data center space, 60 days prior to completion

BEFORE

AFTER

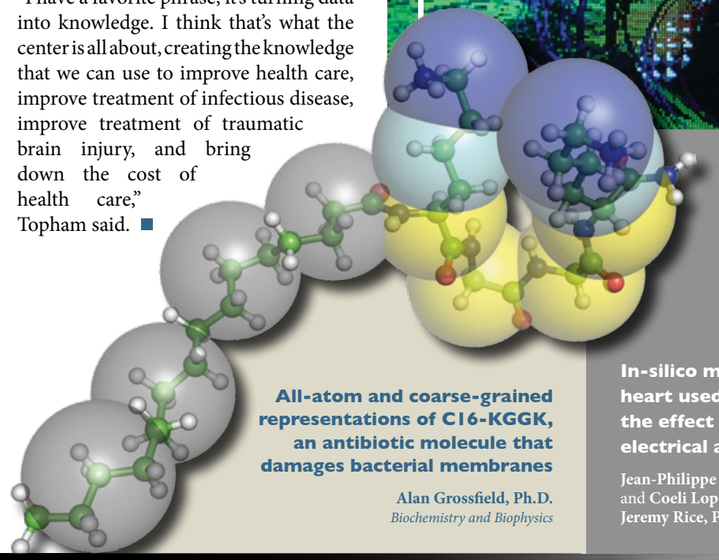
The University's **primary data center** underwent $1.6 million in upgrades in just two months to prepare it for the **Blue Gene/Q**. The new facility includes a 680-square-foot raised floor data center and a viewing gallery with a conference room.

Health Sciences Research



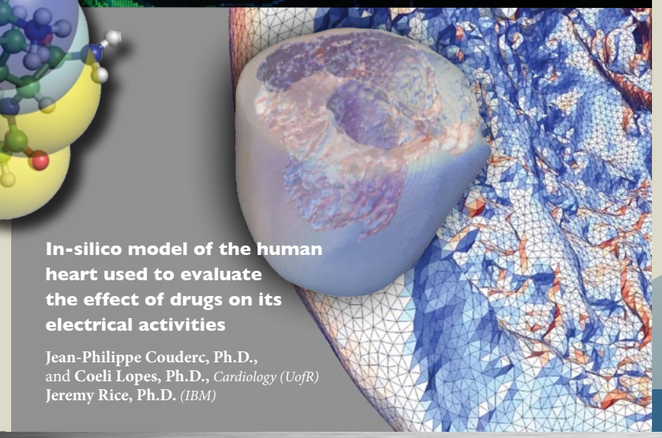
Images from a diffusion MRI that enables more precise, detailed tracking of damage to the brain caused by blows to the head

Jeffrey J. Bazarian, M.D., M.P.H.
Emergency Medicine and Neurology



All-atom and coarse-grained representations of C16-KGGK, an antibiotic molecule that damages bacterial membranes

Alan Grossfield, Ph.D.
Biochemistry and Biophysics



In-silico model of the human heart used to evaluate the effect of drugs on its electrical activities

Jean-Philippe Couderc, Ph.D., and **Coeli Lopes, Ph.D.,** *Cardiology (UofR)*
Jeremy Rice, Ph.D. *(IBM)*

Growth of Supercomputing at the University of Rochester

The **Center for Integrated Research Computing (CIRC)** offers University researchers state-of-the-art computing technology and software, including support for the use and implementation of these resources.

The **CIRC** now supports researchers from more than **35 departments and centers** throughout the University.

The **CIRC** is founded in August 2008.

16 USERS
8 TERAFLOPS

The **BlueHive** launches with 8 teraflops (84 compute nodes). Eventually, it is updated to 16 teraflops.

116 USERS
23 TERAFLOPS

The **Blue Gene/P** opens to the user community in March 2009. The system consists of a single rack (1,024 compute nodes) and 180 TB of storage.

547 USERS
252 TERAFLOPS

The University of Rochester is one of the first academic institutions in the U.S. to receive a **Blue Gene/Q** supercomputer in July 2012. This supercomputer runs 209 teraflops (peak) and has a single rack (1,024 compute nodes) with 400 TB of high-performance storage.

Since 2008, faculty have voluntarily contributed more than $400,000 for additional shared computing resources and support for all CIRC users.

2008 — **2012**

Supercomputing Research Rankings

As of June 2012

THE GREEN 500

Tied for **3rd** on **the Green 500**

500 SUPERCOMPUTER SITES

Tied for **99th** in the June **TOP 500 Supercomputer Sites** list

LEARN AND MAKE THE WORLD **EVER BETTER**

High-Tech Living

O'Brien Hall, the first residence hall built on River Campus in 42 years, opened in August. It welcomed 150 students just one year after its groundbreaking.

The first floor offers three public spaces: a music performance space and a conference room, each equipped with LED displays, and a dance rehearsal room with a built-in sound system. Students do not need technical knowledge to use these systems. When users plug in their device, the room's flat panel display will power on, switch to the appropriate input, and adjust volume to a reasonable level automatically.

Taking a cue from the popular collaborative spaces in Gleason Library, floors 2-5 each have a study room with a flat panel display that students can connect their mobile devices to for group study sessions. Each floor also has a lounge with a 70-inch LED display controlled by a touch panel, allowing students to switch between high-definition cable television and other inputs such as laptops.

A digital signage system is installed at the service desk, giving hall staff a modern way to communicate with residents. Part of an expanding digital signage initiative at the University, the system can incorporate user-generated content, live news feeds, and emergency notifications.

O'Brien Hall is the first residence hall on River Campus to meet LEED gold certification standards for sustainability and conform to Americans with Disabilities Act (ADA) requirements. There are areas of refuge for emergencies and ADA-compliant pathways throughout the building.

Two more buildings will soon join O'Brien Hall in a growth spurt for River Campus. Raymond F. LeChase Hall, the future home of the Warner School of Education, will open for classes in spring 2013, and Ronald Rettner Hall for Media Arts and Innovation is scheduled to open in fall 2013 (see page 15). Both of these buildings will have technology and functionality similar to O'Brien Hall.

Art in the Palm of Your Hand

In August, the Memorial Art Gallery introduced MAGart, a free mobile app that supplements self-guided tours of the Gallery's collection. Users can select one of six tours or browse artwork by title, date, or culture. The profile of each artwork includes an overview, information about the artist, a high-resolution image, and a map of the work's location in the Gallery. An interactive feature called hot spots allows users to tap areas of the image to learn more about the intricate details, history, and story of the artwork. Available for download from iTunes, MAGart is initially compatible with iPhone, iPod touch, and iPad on iOS 4.3 or later. Work is underway to expand access across other platforms. Development of the app was made possible by a grant from the Institute for Museum and Library Services and a gift from longtime Gallery supporter Helen H. Berkeley.

Mobile Services Expand

With more than 8,200 downloads in two years, UR Mobile continues to expand and improve mobile access to University services. Mobile Learn was integrated into UR Mobile in September 2011. Students have used Mobile Learn to access course information in Blackboard more than 26,000 times since its launch. Other recent additions to UR Mobile include schedule information for dining, athletics, and River Campus computing facilities; Medical Center parking availability; bus schedules and locators; and University events, such as Meliora Weekend and Commencement. In the coming year, enhancements to UR Mobile will provide access to menus for University-wide dining services, nutritional information for Medical Center dining services, and information about wellness programs.

LEARN AND MAKE THE WORLD **EVER BETTER**

Medical Students Going Digital

In March 2012, the School of Medicine and Dentistry purchased 103 iPads for all first-year medical students as part of a new e-learning effort. Beginning in fall 2012, first-year students will receive iPads during orientation and Miner Library staff will be on hand to help the students gain proficiency in using the devices.

Beyond having access to digital syllabi and course materials, students view slides on their tablets in lieu of microscopes for their pathology labs. Students also use the iPads in problem-based learning settings to create and share presentations and learning objectives. Some faculty are beginning to create e-textbooks via iAuthor.

Initial feedback from students is that the use of iPads has improved their learning. They also value the tablet's portability because all their materials are readily accessible in one device. One student commented that having the instructor's lecture slides available before class "makes the iPad a great learning tool; you have it right in front of you and you're annotating straight on PowerPoint as you go."

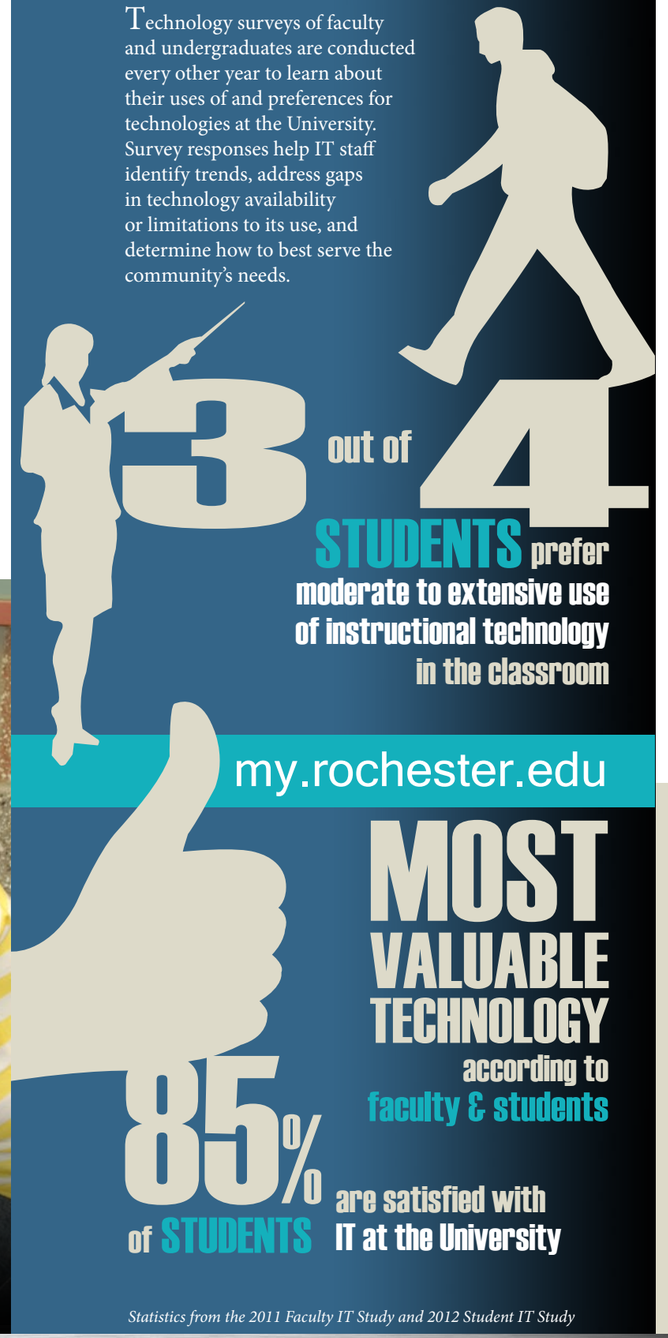
> "We will save a lot of trees, and students will have less to carry in their backpacks."
>
> **David R. Lambert, M.D.**
> *Senior Associate Dean for Medical Student Education*

An online learning specialist will develop increased interactivity in course materials—moving toward rich media, interactive quizzing, and possibly some gaming—to replace or augment segments of the curriculum that lend themselves to a digital format. Medical Center Libraries & Technologies also provides medical students, faculty, and course coordinators with training and technology support to help them make the best use of the iPads in their instruction.

Using an app developed by Medical Center Libraries & Technologies, second-year medical students **Ashley Johnson** and **Ankita Agarwal** review histology slides on their iPads. Other applications provided with the tablet enable PDF annotation, word processing, and electronic slide presentations.

Faculty and Students Share Views on Technology

Technology surveys of faculty and undergraduates are conducted every other year to learn about their uses of and preferences for technologies at the University. Survey responses help IT staff identify trends, address gaps in technology availability or limitations to its use, and determine how to best serve the community's needs.



Statistics from the 2011 Faculty IT Study and 2012 Student IT Study

Nurses Continue Education Online

The School of Nursing launched its second hybrid degree program this year. The Family Psychiatric Mental Health Nurse Practitioner program joins the school's growing suite of online learning offerings, including the hybrid R.N. to B.S. program and online prerequisite courses for the Accelerated Programs for Non-Nurses.

The Center for Lifelong Learning also offers online and hybrid continuing professional education. A broad mix of credit and non-credit courses is available in areas such as anatomy and physiology, medical terminology, and gerontological care.

Students are pleased with the increasing availability of online courses. Many appreciate the flexibility in both time and location that allows them to continue their education while also maintaining full-time jobs and family commitments.

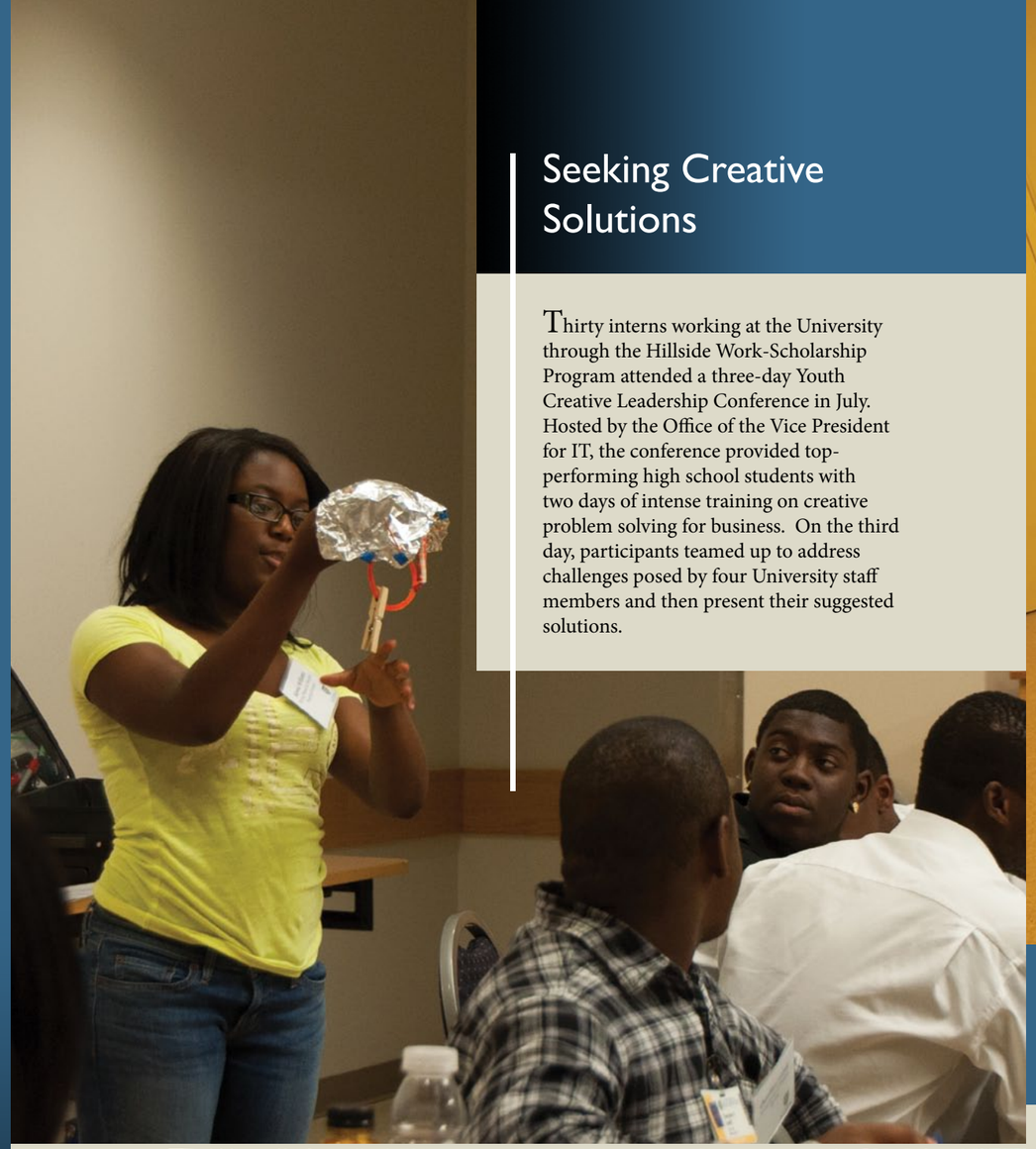
For the 2011-12 academic year, 26 percent of students at the School of Nursing were enrolled in one or more of the school's 41 online and hybrid courses. Approximately 1,300 students opted for online courses and 600 students took hybrid courses.

The School of Nursing is currently expanding two other programs to offer online hybrid options. The goal is to develop six online courses and six hybrid courses each year over the next three years. Andrew Wolf, R.N., A.C.N.P., coordinator for online learning, notes that offering flexible online and hybrid courses can help meet the need of thousands of local nurses who have yet to receive a bachelor's degree—a degree that New York State has proposed requiring registered nurses to earn within ten years.

Type of Course	Proportion of Content Delivered Online	Typical Description
Traditional / Face-to-Face	0%	No online technology used. Content is delivered orally or in writing.
Web Facilitated	1% - 29%	Uses web-based technology to facilitate a face-to-face course. May use a course management system or web pages to post the syllabus and assignments.
Hybrid / Blended	30% - 79%	Blends online and face-to-face delivery. Substantial proportion of content delivered online; typically has online discussions and reduced number of face-to-face meetings.
Online	80% - 100%	Most or all content is delivered online. Typically has no face-to-face meetings.

"Going the Distance: Online Education in the U.S., 2011" / I. Elaine Allen and Jeff Seaman / Sloan Consortium

DISCOVER AND MAKE THE WORLD **EVER BETTER**



Seeking Creative Solutions

Thirty interns working at the University through the Hillside Work-Scholarship Program attended a three-day Youth Creative Leadership Conference in July. Hosted by the Office of the Vice President for IT, the conference provided top-performing high school students with two days of intense training on creative problem solving for business. On the third day, participants teamed up to address challenges posed by four University staff members and then present their suggested solutions.

Tiny Technology, Immense Impact

University officials joined U.S. Representative Louise Slaughter (NY-28) on August 26, 2011, to mark the opening of the Integrated Nanosystems Center, dedicated to researching and fabricating materials on a microscopic level. The center brings together experts in physics, optics, chemistry, biomedicine, and bioengineering to expand the research and technology commercialization of fuel cells, biosensors, and other high-tech devices important to industry, medicine, national security, and the economy. Funded by $4.4 million in federal money, the Nanosystems Center consists of a 1,000-square-foot metrology (measurement) facility and a 2,000-square-foot cleanroom fabrication facility.

University Joins Collaboration on Pervasive Computing

In September 2011, the University joined five other U.S. research universities to form Intel Labs' Science and Technology Center for pervasive computing.

This center will develop three concept applications that represent a new breed of mobile, wearable, and cloud-based computing systems that are dependable, fully aware of users and their activities, and capable of adapting to changes:

- Mobile health and well-being systems that help consumers identify, manage, and reduce stress in their daily lives.
- Family coordination systems that track everyday activities and assist families with planning.
- Task space and smart kitchen systems that help with physical activities that don't typically involve computers, such as cooking a complex recipe or building furniture.

"The next generation of pervasive computing systems... will be capable of supporting complex tasks, such as cooking a soufflé or building a complicated piece of furniture."

Limor Fix, Ph.D.
Director of Academic Programs and Research at Intel

At the University of Rochester, the work is led by Henry Kautz, Ph.D., professor and chair of the Department of Computer Science. Kautz and his students will research pervasive computing systems that act as "personal assistants" and support independent living by the elderly and people with disabilities.

HEAL AND MAKE THE WORLD **EVER BETTER**

Revolutionizing Patient Care

A new electronic medical record system was further integrated into Medical Center operations this year, with all 162 ambulatory sites launching eRecord in May 2012. In place at Strong Memorial and Highland Hospitals since spring 2011, eRecord aims to improve patient safety, increase quality of care, and lower health care costs.

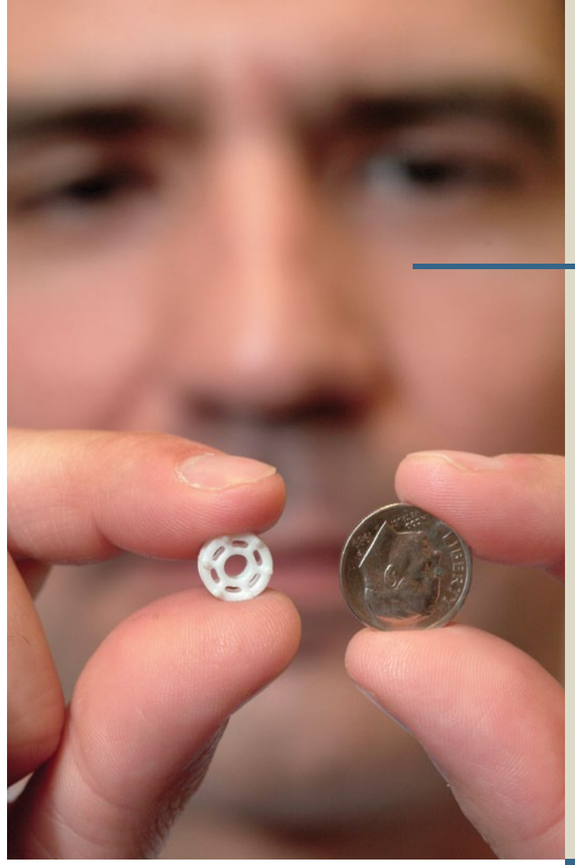
"The instantaneous retrieval of lab data, vital signs, and medications makes rounding a real pleasure. I recognize that the quality of care has taken a quantum leap forward."

Medical Center healthcare provider

Also launched in 2012, MyChart gives patients secure access to their medical information online, including diagnoses, medications, and most lab results. Patients can also request prescription renewals and appointments and save time at medical visits by filling out online questionnaires ahead of time. Android, iPhone, and iPad users can download the MyChart mobile app to access their records on the go. More than 16,000 patients have taken advantage of MyChart to date, and 600 users have tried the application.

Another extension of the eRecord system is ePartner, which allows non-Medical Center healthcare providers to access a patient's information online in a view-only format. Various levels of access can be granted, from complete access to a scaled-back version, depending on the relationship of the clinicians and their work with the Medical Center.

Since the implementation of eRecord, lab turnaround times on common tests have decreased about 17 percent and staff members report that medication administration errors have been avoided.



One Medical Center healthcare provider said, "I am somewhat of a Luddite and was fully prepared to despise eRecord. But I fell in love with it on the first day. For the first time in decades, I can actually read what others are thinking, and I probably save 30 minutes per day not searching for charts. The instantaneous retrieval of lab data, vital signs, and medications makes rounding a real pleasure. I recognize that the quality of care has taken a quantum leap forward."

eRecord is currently rolled out to 95 percent of the Medical Center. Future plans are to migrate other specialty areas, such as cardiology, transplant services, and radiology, to eRecord and to collaborate with other affiliates, including home healthcare providers and referring doctors. A potential secondary use for the data gathered through eRecord is to advance clinical-translational research.

For their herculean efforts, the 170 members of the eRecord implementation team were honored with the University's Meliora Award and the Medical Center Board of Excellence Award.

'Living Chip' to Improve Health

Implantable biosensors currently in development at the Medical Center will allow physicians to remotely monitor patients' health in real time. A patient's cells can be engineered to function as part of the miniature electronic chip, enabling it to detect physiological or chemical changes that can indicate a problem. These timely, accurate results—retrieved without invasive testing common during routine visits—will speed treatment and ultimately help patients remain healthier. A local biotech company founded by Medical Center cardiologist Spencer Rosero, M.D., and two Medical Center labs collaborating on the technology were awarded a patent in 2011. "We believe this technology will change the face of medical monitoring and, ultimately, device therapy for many types of patients," Rosero said.

21st-Century House Calls

The Medical Center merged the old-fashioned concept of house calls with modern Skype-like technology to create a new way to evaluate and treat senior citizens. Built on a longstanding and successful telemedicine program for children, a new research project has enrolled approximately 250 people at 7 local senior living communities to deliver same-day health care services.

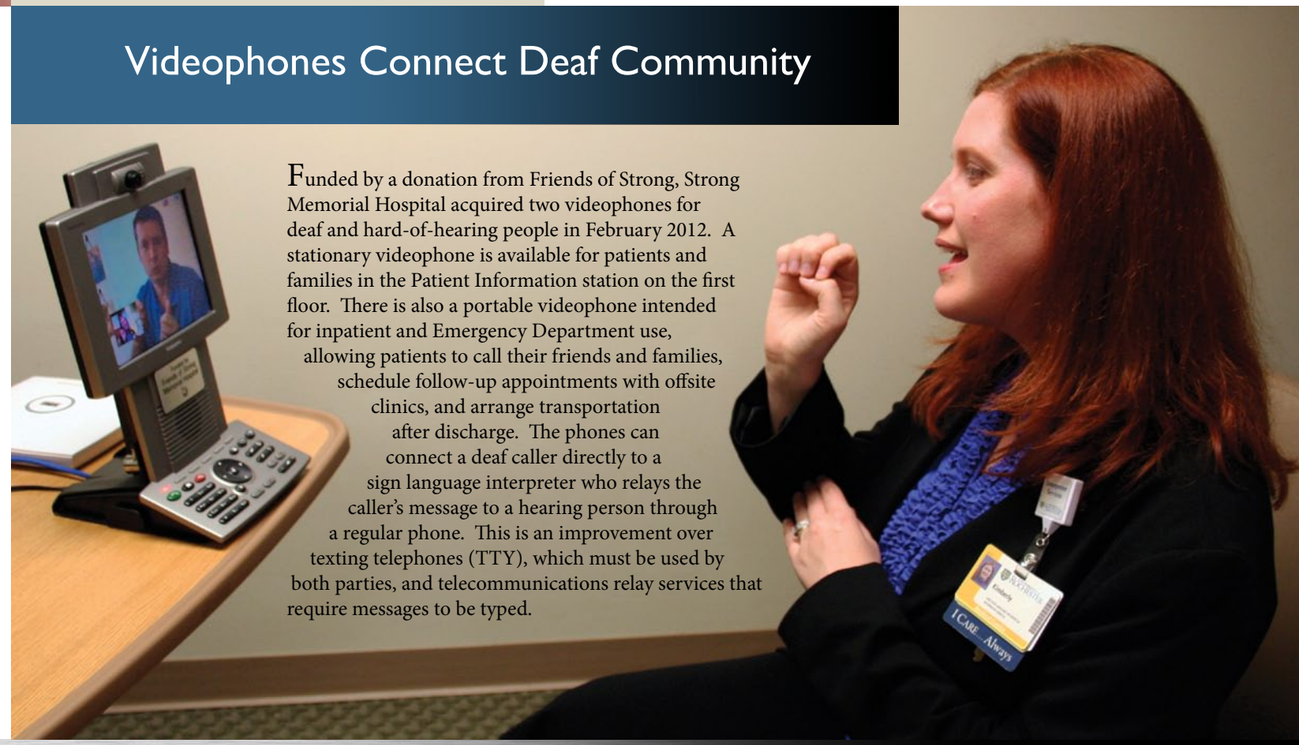
Once a person is enrolled, he/she or a caregiver can call the Strong Health Geriatrics Group any time there is a health concern. After a nurse specialist triages the complaint, a technician travels to the patient's home and sets up a live videoconference between the patient and a physician.

Doctors and nurses can take vital signs, listen to the patient's heart and lungs, assess pain, order blood work, and even have a prescription faxed to the patient's preferred pharmacy within hours of the initial call.

With a shortage of geriatricians amid a growing population of elderly people, the goal is to reduce unnecessary emergency room visits, boost patient satisfaction, and reduce costs.

Patients and their families are pleased with the program so far. "At my age, the technology is a change," 97-year-old Rose Ferrara admitted, "but I love it because you stay right in your room and they come to you and do what they have to do."

Videophones Connect Deaf Community



Funded by a donation from Friends of Strong, Strong Memorial Hospital acquired two videophones for deaf and hard-of-hearing people in February 2012. A stationary videophone is available for patients and families in the Patient Information station on the first floor. There is also a portable videophone intended for inpatient and Emergency Department use, allowing patients to call their friends and families, schedule follow-up appointments with offsite clinics, and arrange transportation after discharge. The phones can connect a deaf caller directly to a sign language interpreter who relays the caller's message to a hearing person through a regular phone. This is an improvement over texting telephones (TTY), which must be used by both parties, and telecommunications relay services that require messages to be typed.

CREATE AND MAKE THE WORLD **EVER BETTER**

Technology Sets a Fast Tempo at Eastman School of Music

The Eastman School of Music continued to expand its online music education curriculum this year. The long-term goal of these efforts is to generate funds to help finance entrepreneurial programs at the school.

Debuted in November 2011, Speed Lessons give students a tool beyond the classroom to help them gain insights into the orchestral repertoire for their instrument. Each Speed Lesson includes a 20-to-45-minute video of an Eastman School professor coaching an Eastman School student and the appropriate sheet music.

"It's the 21st-century way to present musical material," said Ramon Ricker, D.M.A., director of the Institute for Music Leadership and senior associate dean for professional studies. "We're using technology to 'transfer' the knowledge and expertise of Eastman School faculty and give students in-depth insights into musical works."

There are more than 100 lessons available for purchase on eastmanspeedlessons.com for flute, percussion, clarinet, trombone, and horn. Once downloaded, the lessons do not expire and can be viewed repeatedly.

Work is also underway on additional online courses. Introduced in 2009, the first eTheory course, Music Fundamentals in Four Weeks, helps prepare incoming undergraduates for theory placement exams. To date, the course has been widely accepted with more than 800 purchases and is recommended by 50 music schools, including Juilliard. A Chinese translation of eTheory as well as graduate and high school level music theory courses are under development.

New this fall is the availability of web streaming for select events held in Hatch Recital Hall, Kilbourn Hall, and Kodak Hall. Feedback on these test events will shape a full program of streamed events in spring 2013.

Fine-Tuning Music from a Distance

The Eastman School continues to grow its participation in musical events with educational institutions worldwide through Internet2. Highlights from the past year include double bass master classes with the Yong Siew Toh Conservatory of Music at the National University of Singapore, performances in the Australian Early Music Festival held in collaboration with the Australian National University in Canberra, and a showcase featuring the Ying Quartet with Skidmore College. During the next year, the Eastman School will work with Internet2 on ways to offer synchronous performances across greater distances and improve the reliability and efficiency of high-definition video collaborations.

Arts and Sciences Harmonize in New Major

Beginning this fall, a new digital media studies major will offer undergraduates the chance to experiment, collaborate, and learn more about how digital media can be practically applied across an array of disciplines.

This major was designed by faculty from nine disciplines as a way for students to combine a liberal arts perspective of history and analysis with the technological applications of web, audio, and video production. With 20-25 students already enrolled, the major is expected to grow in popularity.

"The digital revolution has significantly changed how people communicate, interact, and innovate, so it makes sense it would also impact the way that today's students learn," said Thomas DiPiero, Ph.D., dean for humanities and interdisciplinary studies.

The Ronald Rettner Hall for Media Arts and Innovation is being constructed to house a fabrication center (or 'fab lab') where students can design and create products; state-of-the-art audio and video recording studios, editing rooms, and equipment; high-end hardware and software for graphics, animation, and 3-D printers; and collaborative learning spaces. It will also offer several flexible group study areas where students can plan, discuss, and create projects.

Scheduled to open in fall 2013, the 18,900-square-foot building will be located in Wilson Quadrangle on River Campus. Rettner Hall will be open 24 hours a day, allowing students to tinker and innovate at whatever hour inspiration strikes.

"Our students' capacity to think critically and flexibly is the key to their future success," said Peter Lennie, Ph.D., provost and Robert L. and Mary L. Sproull Dean of the Faculty of Arts, Sciences and Engineering. "Rettner Hall will provide them with a place to harness their talents broadly and discover new ways to connect the creative arts to the sciences and engineering."

> "Rettner Hall will provide [our students] with a place to harness their talents broadly and discover new ways to connect the creative arts to the sciences and engineering."
>
> **Peter Lennie, Ph.D.**
> *Provost and Robert L. and Mary L. Sproull Dean of the Faculty of Arts, Sciences & Engineering*

> *Digital media is the "new literacy of the 21st century."*
>
> **Thomas DiPiero, Ph.D.**
> *Dean for Humanities and Interdisciplinary Studies*

Rendering provided by Goody Clancy

Mary Pilarz '13, a biology major from Buffalo, NY, won best photo in the "Culture" category for the 4th Annual Study Abroad Photo Contest for her photo, **"MOROCCO: A Camel Ride."**

University's Global Presence Represented Online

Launched in March 2012, the UR Global website is a hub for information about the University's international activities. The site shares information about the University's global partnerships, research, and educational programs while providing opportunities to get involved and stay connected with the University of Rochester from anywhere in the world.

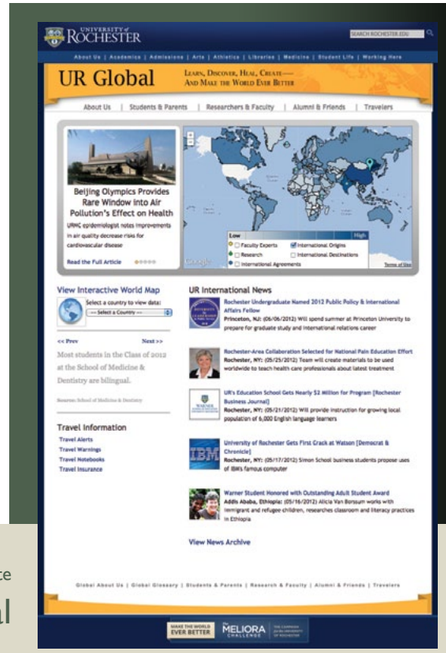
A key feature of the site is an interactive world map that visually represents both the international communities present on campus as well as students and alumni abroad. Color-coded pinpoints indicate areas of faculty research and expertise. Country-specific data is also available by population and school.

Beyond the data and statistics are stories about students, like Darcy Bird '14 who spent her summer helping to unearth the remains of a Roman theater in Spain; faculty, like Robert Foster who rediscovered one of the oldest and largest collections of Pacific Island artifacts in the world; and alumni, like Joseph Kigunda '85W who was instrumental in developing Kenyan sign language. These stories and the photos that accompany them bring the University's international activities to life.

UR Global also features news stories published in our own newsroom and those picked up by national and international media outlets. Resources and content organized by population help students and their families, researchers, faculty, and alumni find out more about study abroad and exchange programs, student groups, research projects, and international University events.

The site uses multimedia and interactive elements to draw interest and encourage community participation in creating content. Travel Notebooks, for instance, allow members of the University community to share their experiences abroad in their own words and photos. Students, faculty, and alumni are also encouraged to tweet about their international travels using the hashtag #urglobal.

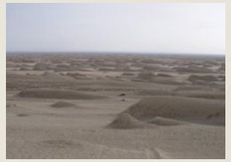
> "UR Global is a phenomenal resource to help highlight the University's ubiquitous, but often fragmented, international activities and to create connections and synergies between people and programs throughout the world."
>
> **Cary Jensen, J.D.**
> *Senior Counsel and Director of International Services Office*



UR Global website
rochester.edu/global

Global Views

Travel Notebooks



Carmala Garzione

In May 2011, I spent a few weeks working in far western China on the Tibetan Plateau ... [to] study the tectonic evolution of Tibet and its impact on climate. We spent a lot of time driving and hiking over remote, roadless areas to scout for continuous sections of rock that preserve depositional environments over long time periods.

Cary Jensen

I recently spent two magical days in Kathmandu, Nepal visiting significant religious and cultural sites. We also took a memorable 45-minute Buddha Air scenic flight over the Himalayan mountain range for some breathtaking views of Mt. Everest, known locally as "Sagarmatha."

Recent Tweets

@kathrynaurelia
Lovely performance by Eastman and Beijing viola ensembles @IVC2012 #urglobal

@sllyptl
Sat next to a @UofR alum on the plane back from Mumbai! #smallworld #urglobal

@Suzyley
Thanks to @UofR Advancement for hosting "The Egyptian Revolution: A Year Later" ... insightful lecture and discussion. #urglobal

@ProjectPaz
We wanna thank the @amnesty chapter at @UofR for supporting our cause to bring #peace in Juarez #Mexico. #urglobal

Finance Information System Being Replaced

In the coming year, the University will initiate a multi-million dollar project to replace its 26-year-old finance information system. This project is intended to mitigate risks resulting from a growing gap between the legacy system and modern practices. July 2014 is the proposed go-live date for core functionality, including the chart of accounts, general accounting and reporting, fund accounting, and accounts payable. All remaining functionality is targeted for a July 2015 release.

Sponsored by the Senior Vice President for Administration & Finance and Chief Financial Officer, Ronald J. Paprocki, this project will mobilize in fall 2012. The project manager, team leads, consulting partners, and core team members have been named and together bring great experience to this project.

The University of Rochester is one of the first among its peers to select a Software-as-a-Service (SaaS) provider for one of its major administrative systems. SaaS centrally hosts software and associated data in the cloud, allowing users to access the data via a web browser. The considerable advantage of SaaS is its significantly lower implementation and operating costs in contrast to more traditional solutions. In addition, advances in technology have made it possible for these providers to offer security controls that meet all regulatory requirements.

The functional areas within scope are:

- **Chart of accounts design and integration**
- **General accounting and reporting**
- **Fund accounting**
- **Accounts payable**
- **Billing and accounts receivable**
- **Budget development, forecasting, and modeling**
- **Encumbrance of payroll expense**
- **Post-award grant management**
- **Treasury**

University Events Accessible from Around the World

University community members and their families and friends participate virtually in a variety of University events, such as Meliora Weekend (see page 20), the annual Diversity Conference, and some athletic events. The 2001 commencement ceremony was the first event to be streamed live on the web, with viewers from as far as Seattle. The University has continued to stream Commencement every year since. Football, soccer, and basketball games are streamed on a regular basis while the swimming and diving championships are available for online viewing when they are held in Rochester.

Over the last year, the University has also streamed momentous events, such as the YellowJackets receiving a key to the city from Mayor Thomas Richards. Many event recordings are later posted to the University's YouTube channel. However they choose to share in University events, alumni can reconnect with their alma mater no matter where they live around the world.

Online Ticket Sales

MELIORA WEEKEND
OCTOBER 21-23, 2011

355 EVENTS

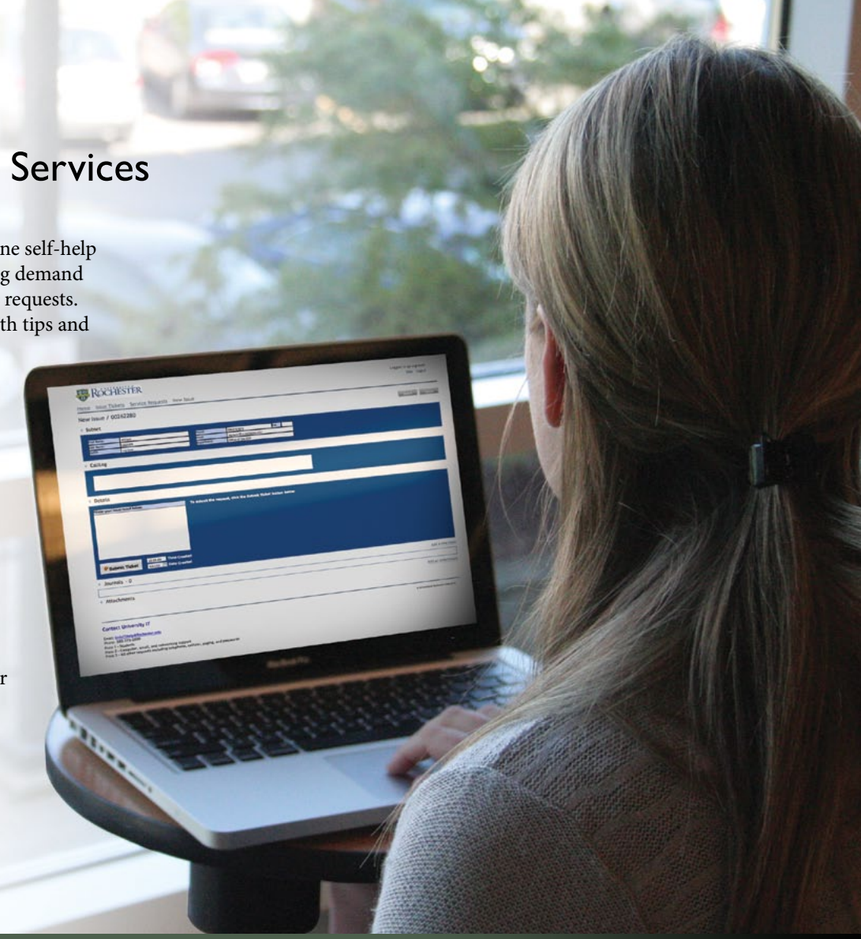
4,308 REGISTRATIONS

6,130 ATTENDEES

Meliora Weekend Guest List Swells

The launch of the Meliora Challenge—the largest capital campaign in the University's history—joined homecoming, reunions, and Family Weekend for another memorable Meliora Weekend. Tickets for the three-day celebration in October 2011 sold out online in less than five minutes. For the first time, 650 guests virtually joined a sold-out crowd of 2,300 via a live web stream of the keynote address by former President Bill Clinton. The stream was available to users with a wired, wireless, or VPN connection to the University network. *Campus Times* praised the addition of web streaming as "a perfect way to settle the issue [of ticket availability]."

Improving IT Help Services

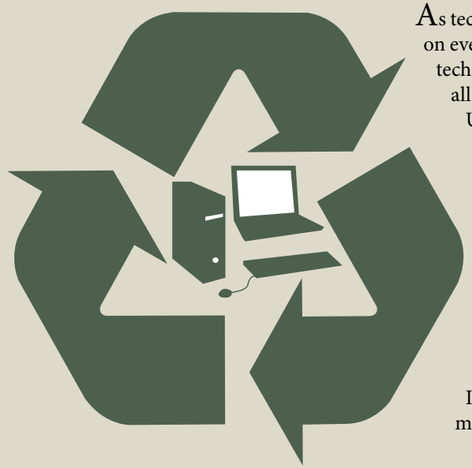


The IT Help Desk unveiled new online self-help services this year to address increasing demand for quicker turnaround times on help requests. Features include a knowledge base with tips and frequently asked questions, online chat support, and electronic IT Service Request forms.

Users can now submit tickets online, receiving immediate email confirmation, and track in real time the status of their requests. Having another approach for requesting assistance, in addition to telephone, email, and walk-in options, is appealing for many users.

In further efforts to improve customer service, Help Desk agents continue to cross-train in order to take calls for other Help Desk locations during departmental meetings.

Secure Electronics Recovery Program Established

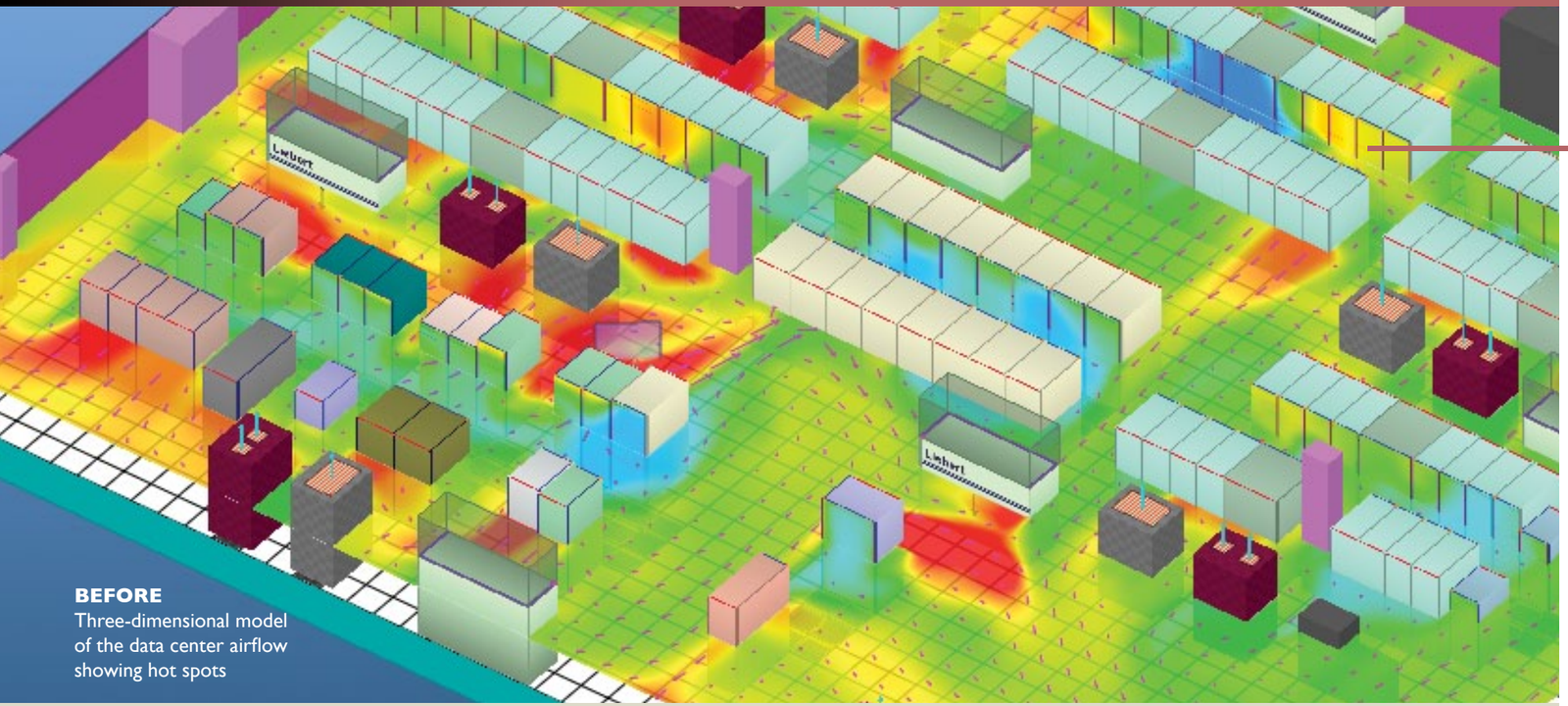


As technology becomes ubiquitous and increasingly sophisticated, with data stored on everything from computers to mobile devices to copiers, it is important that this technology be disposed of securely. Beginning in August and initially serving all departments outside of the Medical Center, a secure disposal service for University-owned electronics is now available free of charge. Faculty and staff simply email the IT equipment recovery team to schedule a pick-up time, which is generally within a few days of the request.

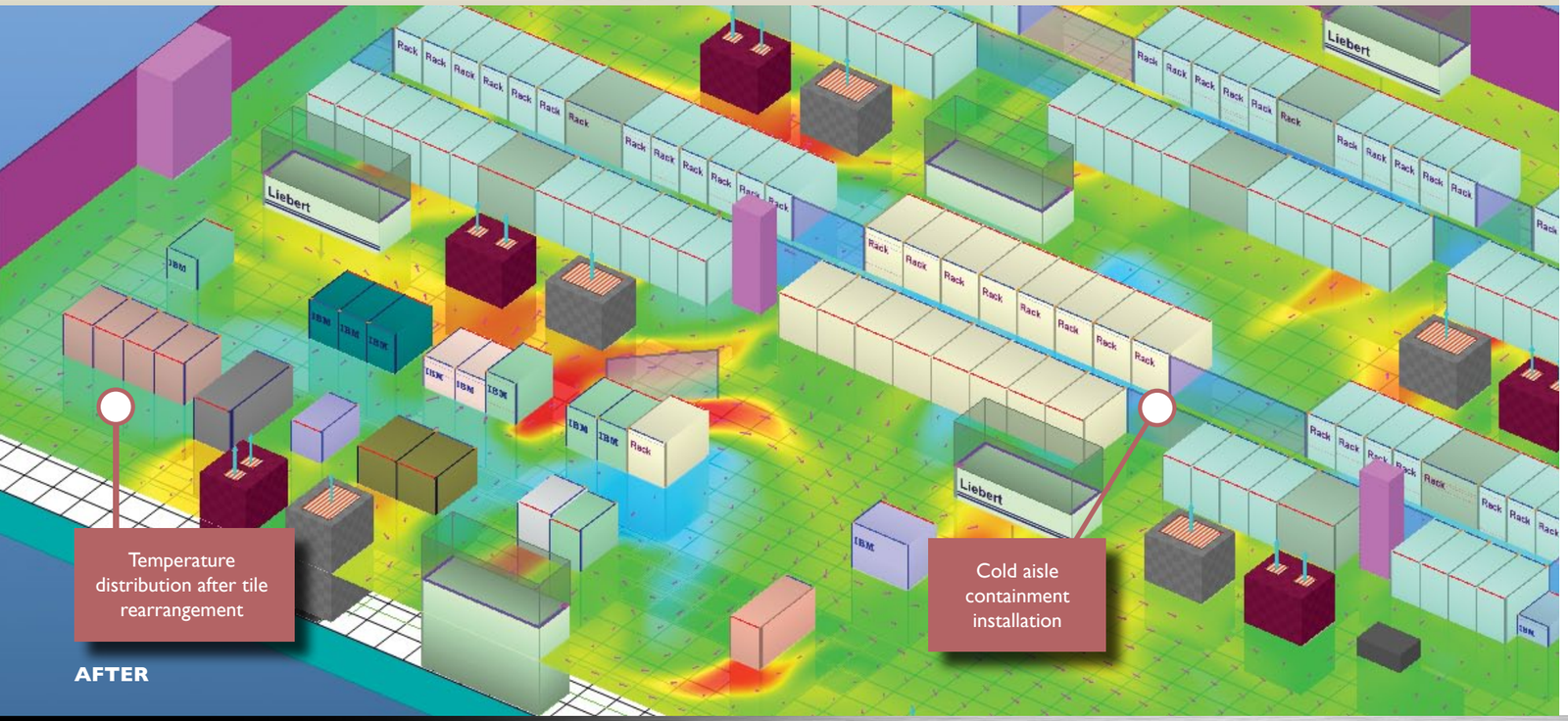
Any IT equipment that does not contain hazardous materials is eligible for disposal through this program, including desktop and laptop computers, inkjet and laserjet printers, servers, network equipment, keyboards, and mice. After pickup, the equipment is moved to a secure location and sorted, where eligible equipment is then recycled in bulk through a local company and repurposed in U.S. electronics.

In its first month, the equipment recovery program completed 15 pickups for more than 20,000 pounds of equipment.

Solidifying Infrastructure



BEFORE
Three-dimensional model of the data center airflow showing hot spots



AFTER

Ongoing Energy Efficiency at the Data Center

The primary data center has maximized the efficiency and reliability of the University's computing resources by utilizing several new innovative tools to model and adjust airflow patterns.

Cold and hot air are constantly being displaced within the data center. A new software tool uses algorithms to calculate hot and cold air patterns and then create three-dimensional models of airflow in the raised floor space. This allows data center specialists to optimize airflow, keeping computing equipment cool and improving its efficiency. Using the models generated by the software, simple adjustments, such as tile rearrangement on the data center floor, can make a considerable difference.

According to Eileen Wirley, associate chief information officer, "Data center cooling optimization has resulted in significant operating cost savings and the deferral of major capital improvements, all while minimizing energy consumption in alignment with the University's focus on sustainability."

Preventing the mix of cold and hot air is key to lowering energy consumption. To address this issue at the primary data center, specialists started using cold aisle containment in August. Partitions are installed at the ends of the computing rack aisles and any gaps within the hardware units are enclosed. Cold air that is released through vents in the floor can be contained and deployed to specific locations within this area. Heat produced by the computer systems can exit from the opposite side and avoid mixing with the cold air.

Modular cooling was installed at the secondary data center in May 2012 and has proven to be 90 percent more efficient than the standard computer room air conditioning units. Easily installed on the back of the computing equipment, this scalable option permits cooling as close to the source of the heat as possible. Modular cooling significantly reduces the internal temperature of the units while also reducing the hot air exhaust. Internal fans will run at lower speeds, improve overall server reliability, and result in a lower carbon footprint.

"Data center cooling optimization has resulted in significant operating cost savings and the deferral of major capital improvements, all while minimizing energy consumption in alignment with the University's focus on sustainability."

Eileen Wirley
Associate Chief Information Officer

The utilization of these tools has allowed the University of Rochester to receive rebates from Rochester Gas and Electric (RG&E) and the New York State Energy Research and Development Authority (NYSERDA). Regarding the new energy efficient features, John Fitzpatrick, assistant director of the data center, said, "For a university the size of the University of Rochester, you can see significant savings to our electrical costs."

Security Efforts Balance Usability and Risk

The University continues to lower its risk while maintaining usability by implementing an information security strategy that provides layers of defense to protect University information systems.

The number of computing devices that broadcast their presence to the Internet has been reduced from approximately 20,000 devices in 2010 to fewer than 1,100 managed devices in 2012. Significant progress has been made with automated role-based workflow through the timely creation and deletion of University accounts for employees and students. The accuracy of University-wide distribution lists used for communications to faculty, staff, and students during routine and emergency situations has improved.

Much of this progress has been accomplished through the governance of the Data Security Task Force and ongoing coordination with departments using the Information Security Liaison network—a group of employees from major units across the University who help evaluate areas of risk and communicate with employees in their units.

As the University community's use of technology changes, so do the information security risks. With the increasing use of mobile devices, the focus for the coming year will be on providing the ability to securely manage mobile access to University information.

Students Laud New Wireless Service

UR_Connected, the newest wireless service that launched in early 2011, not only provides the highest level of security, but it also boosts convenience for users. UR_Connected only requires a single login: it does not disconnect as users move around campus where coverage exists, and it reconnects automatically when users turn on their wireless devices. Students commended the new service in the 2012 Student IT Study, citing it as one of the most valuable technologies at the University. One student remarked, "I love the UR_Connected rollout. I didn't realize how annoying the repeated login prompts were until I didn't have them anymore."

Security Awareness

The introduction of interactive materials has revitalized education and awareness around information security issues. Students were invited to play an online zombie game where the player learned how to combat everyday information security threats in order to survive the zombie apocalypse. A fun video titled "Phishing Bells" educated viewers on how to avoid falling victim to phishing scams during the holiday shopping season. "Phishing Bells" received the 2012 Award of Excellence from the Special Interest Group on University and College Computing Services (SIGUCCS).

To view the security awareness videos, visit:

rochester.edu/it/security/videos

Charging Mobile Devices Is a Picnic

A new addition to River Campus scenery is a solar powered charging station that was installed near Meliora Hall in October 2011. Housing four electrical outlets and two USB outlets, the 235-watt Solar Dok allows the campus community to use sustainable energy to charge their laptops, cell phones, and other mobile technology while enjoying the outdoors. It is also equipped with LED lights for nighttime use. The table is constructed entirely of recycled or recyclable materials, including approximately 1,200 milk jugs. *Campus Times* gave the Solar Dok a cheer, citing it as "an awesome addition to campus."

Network Expansion Supports Growing Needs

The University's regional network provides 24/7 connectivity to its campuses and offsite facilities. With the recent expansion to include the second data center, this network has more than doubled in length from 66 to 136 miles of fiber.

The University's strategic priorities will continue to drive enhancements to its network. Massive amounts of data generated by research in clinical and translational sciences will have implications for network capacity. Similarly, initiatives like online learning will bring a greater reliance on the ability of the network to support new services, such as telepresence, for a geographically diverse community.

New services are being offered that take advantage of this infrastructure, such as Voice over Internet Protocol (VoIP), which the University and some of its offsite facilities are already using successfully. The transition from traditional analog phone systems to VoIP enables enhanced functionality and increases convenience.

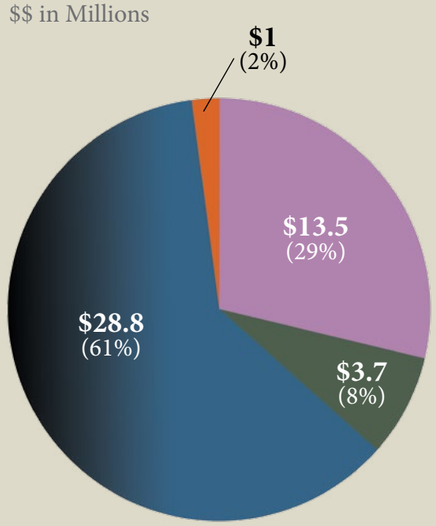
Leveraging the regional network also saves the University approximately $1.8 million in external telecommunications costs annually.

Upgrades to the wireless network are ongoing with coverage extending into three residence halls (O'Brien Hall and Anderson and Wilder Towers) and the adjoining athletic field area on River Campus, as well as the Laboratory for Laser Energetics on South Campus.

UNIVERSITY-WIDE FINANCIAL OVERVIEW

Annual Payroll for Staff in IT Job Codes by Division *

Fiscal Year 2012
$$ in Millions



Total: $47M

Strong Memorial Hospital/Faculty Practice
School of Medicine & Dentistry
School of Nursing

University Central Administration

Arts, Sciences and Engineering

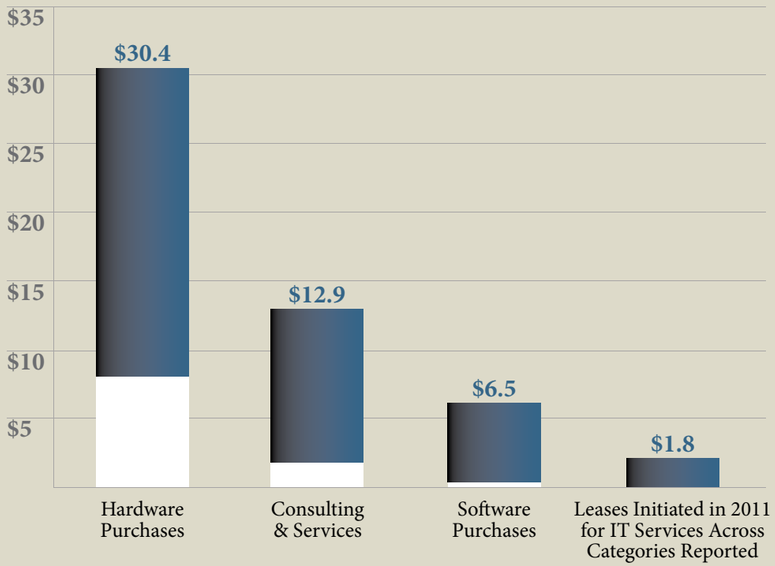
All Others: Simon, Eastman, Warner, and Memorial Art Gallery

* Excludes benefits and Time as Reported (TAR)
While individual pay rates are available in HRMS, actual costs can only be determined through examination of payroll data, which would require a different analysis.

Source: Human Resources

Vendor Payments for Technology

Calendar Year 2011
$$ in Millions



Total: $51.6M
(eRecord: $9.9M)

eRecord expenditures

Note: This represents one year of the eRecord project, not the total project.

Sources: Corporate Purchasing, University Finance, Treasury Office, and Financial Services, SMH

2012 - 2013 IT COMMITTEES & COLLABORATIONS

IT Steering Group

This group is focused on establishing more prioritized coordination and decision making for IT University wide.

Chair: Peter Lennie, Provost and Robert L. and Mary L. Sproull Dean of the Faculty of Arts, Sciences & Engineering

Committee Members:
Bradford C. Berk, *Sr. Vice President for Health Sciences & CEO*
David E. Lewis, *Vice President for IT & CIO*
Bill Murphy, *Vice President of Communications*
Ron Paprocki, *Sr. Vice President for Administration & Finance and CFO*
Jerry Powell, *Associate Vice President and CIO of Medical Center*
Sue Stewart, *Sr. Vice President and General Counsel*

IT Advisory Council

This group, established in 2007, serves as a University-wide advisory body to the Office of the Vice President for IT regarding the use of information technology in support of the University's core missions of teaching and learning, research, healthcare, and community service.

Chair: David E. Lewis, Vice President for IT and CIO

Committee Members:
Anjan Bagchee *(School of Medicine & Dentistry)*
John Barden *(University IT)*
Michael Bell *(River Campus Libraries)*
Julie Buehler *(University IT)*
Holly Crawford *(Budgets & Planning)*
Kate Crowley *(University IT)*
Rajiv Dewan *(Simon School)*
Tom DiPiero *(Dean's Office; Arts, Sciences & Engineering)*
Robert Evangelista *(University IT)*
Adam Frank *(Physics & Astronomy)*
Eric Fredericksen *(University IT)*
Dave Garcia *(Warner School)*
Brian Harrington *(School of Nursing)*
David Krusch *(Chief Medical Information Officer)*
Joe Meister *(Assoc. VP of Advancement Services)*
Julie Myers *(University IT)*
Lori Packer *(University Communications)*
Jerry Powell *(Assoc. VP and CIO of Medical Center)*
Samantha Singhal *(Office of the VP for IT)*
Helen Smith *(Eastman School of Music)*
Julia Sollenberger *(Assoc. VP, Medical Center Libraries & Technologies)*
Nancy Speck *(University Registrar)*
Ted Vaczy *(Information Systems Division, Medical Center)*
Eileen Wirley *(University IT)*
Doug Wylie *(University Controller)*

IT Campus Leaders

Information technology leaders across the University share information, develop recommendations and proposals, and support subgroup and special interest group collaborations through the IT Campus Leaders group.

Chair: David E. Lewis, Vice President for IT and CIO

Committee Members:
Joe Anderson *(Biology)*
Anjan Bagchee *(School of Medicine & Dentistry)*
John Barden *(University IT)*
Mike Bell *(River Campus Libraries)*
Julie Buehler *(University IT)*
Kate Crowley *(Office of the VP for IT)*
Robert Evangelista *(University IT)*
Hoss Firooznia *(Mathematics)*
Eric Fredericksen *(University IT)*
Dave Garcia *(Warner School of Education)*
Brian Harrington *(School of Nursing)*
Rick Haverty *(Information Systems Division, Medical Center)*
Tony Lenzo *(Political Science)*
Eric Lobenstine *(Chemistry)*
Sharon Martinez *(Web Services, Medical Center)*
Dave Munson *(Physics & Astronomy)*
Julie Myers *(University IT)*
Alex Nakonechnyi *(Simon School of Business)*
Chip Nimick *(University IT)*
Jerry Powell *(Assoc. VP and CIO of Medical Center)*
Alex Ryskin *(Laboratory for Laser Energetics)*
Michael Schell *(Radiation Oncology)*
John Simonson *(Hajim School of Engineering & Applied Sciences)*
Helen Smith *(Eastman School of Music)*
Ted Vaczy *(Information Systems Division, Medical Center)*
Evi Vanoost *(Rochester Center for Brain Imaging)*
Eileen Wirley *(University IT)*

Data Security Task Force

The Data Security Task Force provides guidance on how to maintain and strengthen the University's information security through policy development, project prioritization, and security awareness.

Co-Chair: Peter Lennie, Provost and Robert L. and Mary L. Sproull Dean of the Faculty of Arts, Sciences & Engineering

Co-Chair: Sue Stewart, Sr. Vice President and General Counsel

Committee Members:
Salim Alani *(University Audit)*
John Barden *(University IT)*
Pat Beato *(Chief Privacy Officer, Medical Center)*
Michael Bell *(River Campus Libraries)*
Mark Cavanaugh *(Environmental Health & Safety)*
Richard Crummins *(Office of General Counsel)*
Tim Eldred *(Human Resources)*
Michael Goonan *(Vice President and Chief Finance Officer, Medical Center)*
Kathy King-Griswold *(Office of Treasury Management)*
David Krusch *(Chief Medical Information Officer)*
David E. Lewis *(Vice President for IT and CIO)*
Sharon Martinez *(Web Services, Medical Center)*
Walter Mauldin *(University Security)*
Joseph Meister *(Assoc. VP of Advancement Services)*
Julie Myers *(Chief Information Security Officer)*
Jason Pickup *(University IT)*
Michael Pinch *(Chief Information Security Officer, Medical Center)*
Jerry Powell *(Assoc. Vice President and CIO, Medical Center)*
Barb Saat *(Human Resources)*
Paul Schneider *(University Audit)*
Robert Shrack *(Medical Center Security)*
Samantha Singhal *(Office of VP for IT)*
Nancy Speck *(University Registrar)*
Spencer Studwell *(Assoc. VP and Assoc. General Counsel Risk Mgmt., Medical Center)*
Douglas Wylie *(University Controller)*

University of Rochester Medical Center Academic IT Group

The goal of this committee is to leverage technology resources and promote collaboration across the Academic/ Research Enterprise of the Medical Center.

Chair: Ted Vaczy, Director of Planning & Academic IT, Information Systems Division
Co-Chair: Anjan Bagchee, Project Director, School of Medicine & Dentistry

Committee Members:
Steve Brewster *(Web Services, Medical Center)*
John Barden *(University IT)*
Pat Beato *(Medical Center Finance)*
Jeffrey Bloss *(School of Medicine & Dentistry)*
Steve Clary *(Medical Center Libraries)*
Chris DaSilva *(Orthopaedics)*
Tina DePalo *(Information Systems Division)*
Dawn DePerrior *(Information Systems Division)*
Michael Goonan *(Vice President & CFO, Medical Center)*
Bob Greisberger *(School of Medicine & Dentistry)*
Brian Harrington *(School of Nursing)*
David A. Krusch *(School of Medicine & Dentistry)*
David E. Lewis *(Vice President for IT and CIO)*
Sharon Martinez *(Web Services, Medical Center)*
Daniel McCarthy *(Community & Preventive Medicine)*
Brendan Mort *(Center for Integrated Research Computing)*
Richard Partridge *(University IT)*
William Passalacqua *(School of Medicine & Dentistry)*
Mike Pinch *(Chief Information Security Officer, Medical Center)*
Jerry Powell *(Assoc. VP & CIO of Medical Center)*
Peter Robinson *(Vice President & COO of Medical Center)*
Kevin Sciacca *(Department of Medicine)*
Mark Schwartz *(Medical Center Facilities)*
Julia Sollenberger *(Assoc. VP of Medical Center Libraries & Technologies)*
Eileen Wirley *(University IT)*

College IT Community

The goal of the College IT Community is to leverage technology resources and promote collaboration throughout Arts, Sciences and Engineering.

Chair: Devarajulu Ravichandran, Senior IT Officer; Arts, Sciences & Engineering
Co-Chair: Eric E. Fredericksen, Assoc. Vice Provost, University IT

Committee Members:
Joe Anderson *(Biology)*
Amy Ariola *(University IT)*
Stefano Bastianelli *(Residential Life)*
Doug Bentley *(University IT)*
Glenn Berger *(University IT)*
Lisa Brown *(University IT)*
Andrea Campbell *(University IT)*
Cynthia Carlton *(River Campus Libraries)*
Terrance Collins-Howard *(University IT)*
Dave Costello *(Computer Science)*
Kate Crowley *(Office of the CIO)*
Robert Evangelista *(University IT)*
Mat Felthousen *(University IT)*
Mike Finger *(University IT)*
Hoss Firooznia *(Mathematics)*
Mike Fitch *(University IT)*
Jessica Foster *(Dean's Office; Arts, Sciences & Engineering)*
Michael Frank *(Art & Art History)*
Eric Fredericksen *(University IT)*
Chris Freemesser *(Brain & Cognitive Sciences)*
Chris Grant *(Kearns Center for Leadership & Diversity)*
Rich Hayden *(River Campus Libraries)*
Garry Henderson *(Registrar's Office)*
Cyndy Hervey *(University IT)*
Tony Lenzo *(Political Science)*
Robert Lindholm *(Hajim School of Engineering & Applied Sciences)*
Eric Lobenstine *(Chemistry)*
John Lonneville *(University IT)*
Arthur Loveland *(Clinical & Social Psychology)*
Mike Masco *(Auxiliary Operations)*
Brendan Mort *(Center for Integrated Research Computing)*
Dave Munson *(Physics & Astronomy)*
Julie Myers *(University IT)*
Russell Nordquist *(Center for Integrated Research Computing)*
Joe Parker *(University IT)*
Rich Partridge *(University IT)*
Joe Pasquarelli *(University IT)*
Jason Pickup *(University IT)*

Richard Pink *(University IT)*
James Prescott *(Hajim School of Engineering & Applied Sciences)*
James Roche *(Computer Science)*
Rich Sarkis *(Physics & Astronomy)*
John Simonson *(Hajim School of Engineering & Applied Sciences)*
Sean Singh *(University IT)*
John Strong *(Hajim School of Engineering & Applied Sciences)*
Evi Vanoost *(Rochester Center for Brain Imaging)*
Eileen Wirley *(University IT)*
John Wolfe *(University IT)*

Research Computing Sponsors

The Research Computing Sponsors provide support and strategic guidance to the Center for Integrated Research Computing.

Convener: Eric E. Fredericksen, Assoc. Vice Provost, University IT

Sponsors:
Julie Buehler, Deputy CIO
David E. Lewis, Vice President for IT and CIO
Brendan Mort, Director of the Center for Integrated Research Computing
William Passalacqua, Sr. Assoc. Dean of Finance & Administration, School of Medicine & Dentistry
Jerry Powell, Assoc. Vice President and CIO, Medical Center
Edward Puzas, Sr. Assoc. Dean of Basic Research, School of Medicine & Dentistry
David Topham, Executive Director of Health Sciences Center for Computational Innovation
Ted Vaczy, Director of Planning & Academic IT, Medical Center
Dave Williams, Dean for Research; Arts, Sciences & Engineering

Research Computing

Leading faculty researchers from across the University collaborate on high-performance research computing. Their efforts result in a more effective and efficient approach to computational research through the Center for Integrated Research Computing (CIRC). The CIRC provides researchers with the technology, software, training, and support necessary to fully utilize high-performance computation in research activities spanning all areas of academic scholarship.

Chair: Adam Frank, Professor of Physics & Astronomy
Co-Chair: Eric E. Fredericksen, Associate Vice Provost, University IT

Committee Members:
Miguel Alonso *(Institute of Optics)*
Stephen Burns *(Mechanical Engineering)*
Stephen Dewhurst *(Microbiology & Immunology)*
Cynthia Ebinger *(Earth & Environmental Sciences)*
Alan Grossfield *(Biochemistry & Biophysics)*
Jay Hong *(Economics)*
Michael Huang *(Electrical & Computer Engineering)*
David Krusch *(Surgical Oncology)*
David Lewis *(Vice President for IT and CIO)*
Gunta Liders *(Office of Research & Project Administration)*
Jingming Ma *(Biostatistics & Computational Biology)*
David Mathews *(Biochemistry & Biophysics)*
Kevin McFarland *(Physics & Astronomy)*
Brendan Mort *(Center for Integrated Research Computing)*
Russell Nordquist *(Center for Integrated Research Computing)*
Richard Partridge *(University IT)*
Alex Pouget *(Brain & Cognitive Sciences, Center for Visual Science)*
Jerry Powell *(Assoc. VP & CIO of Medical Center)*
Alex Ryskin *(Laboratory for Laser Energetics*
Michael Scott *(Computer Science)*
Curtis Signorino *(Political Science)*
Paul Slattery *(Physics & Astronomy)*
Minjae Song *(Economics)*
Scott Steele *(Office of Research Alliances)*
Harry Stern *(Center for Integrated Research Computing)*
Devarajulu Ravichandran *(Dean's Office; Arts, Sciences & Engineering)*
John Tarduno *(Earth & Environmental Sciences)*
David Topham *(Health Sciences Center for Computational Innovation)*
Allen Topolski *(Art & Art History)*
Ted Vaczy *(Information Systems Division, Medical Center)*
Dave Williams *(Optics, Biomedical Engineering, and Brain & Cognitive Sciences)*
Eileen Wirley *(University IT)*

LEARN
DISCOVER
HEAL
CREATE

AND MAKE THE WORLD

EVER BETTER