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# Record

Oct. 19, 2006

Volume 31 No. 11



Washington University in St. Louis

## Cutting-edge art museum to be dedicated Oct. 25

Maki is architect for U.N. expansion, Tower 4 at the World Trade Center site

By LIAM OTTEN

In 1960, a young Japanese architecture professor named Fumihiko Maki completed his first commission — Steinberg Hall — while teaching at Washington University. For years that building, which showcased the University's renowned art collection, represented Maki's only built work in the United States.

Four decades later, Maki is among the world's premier architects, a Pritzker Prize winner known for creating monumental spaces that fuse Eastern and Western sensibilities. His current projects include both the \$330 million U.N. expansion in Man-

hattan and Tower 4 at the former World Trade Center site, scheduled to open in 2008 and 2011, respectively.

Now, Maki has returned to campus with the new Mildred Lane Kemper Art Museum, a dramatic, light-filled structure that will showcase the University's internationally renowned art collection.

The Kemper Art Museum is both centerpiece and public face of the new Sam Fox School of Design & Visual Arts. The five-building, \$56.8 million complex also features Maki's new studio building, Earl E. and Myrtle E. Walker Hall, as well as the recently renovated Bixby and Givens halls and

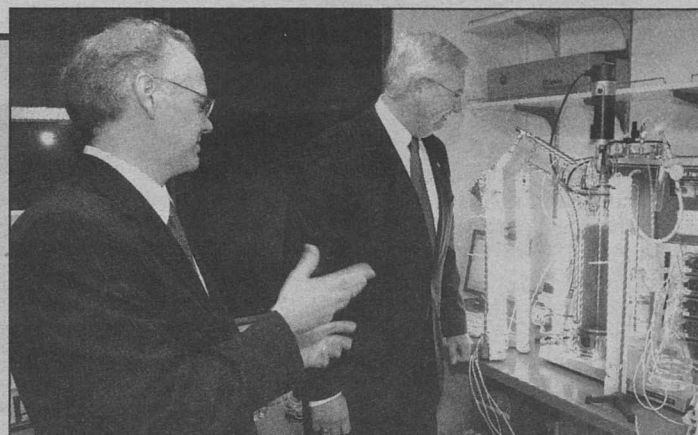
Maki's original commission, Steinberg Hall, which will be renovated during the 2006-07 year.

Both new buildings will be dedicated during a ceremony at 3 p.m. Wednesday, Oct. 25. Festivities also will include openings for the museum's inaugural exhibitions as well as an open house of the entire Sam Fox School complex, from 4:30-8 p.m.

Shuttle service from The MUNY parking lot in Forest Park to the Sam Fox School will be available from 2-8:30 p.m. For more information, call 935-7382 or e-mail [sylvia.stoll@wustl.edu](mailto:sylvia.stoll@wustl.edu).

"The Sam Fox School strengthens the arts at Wash-

See Complex, Page 6



**EPA recognition** Bruce Backus (left), assistant vice chancellor of environmental health and safety, and U.S. Environmental Protection Agency Administrator Stephen L. Johnson tour the laboratory of Himadri Pakrasi, Ph.D., the Endowed Professor of Biology in Arts & Sciences and professor of energy in the School of Engineering and Applied Science Oct. 11. Johnson visited campus to announce a new national compliance assistance center for colleges and universities. He recognized the leadership WUSTL has shown managing hazardous waste and also praised the active role Backus has played in higher education laboratory safety.

## WUSTL makes great strides in energy conservation, costs

By ANDY CLENDENNEN  
AND BETH MILLER

Nearly 15 years ago, energy usage at both the Medical and Danforth campuses was operating near maximum capacity. Today, it's a whole new story.

On the Danforth Campus in 1992, utility systems could not support future building growth; utility infrastructure was obsolete and inefficient; the central steam plant was coal fired, labor intensive and environmentally unfriendly; steam losses exceeded steam loads during summer operation; electrical capacity was near its limit; electrical distribution was unreliable; and many buildings were not air conditioned.

"As an example, the only major summer steam load on the Danforth Campus was for chiller op-

erations — for air conditioning — and the chillers were inefficient and the steam load was not great enough to use all the steam produced," said Ralph Thaman, associate vice chancellor and director of facilities planning and management. "Therefore, steam was wasted causing the excessive use of fuel that was costly."

To solve these issues, the Danforth Campus facilities department outlined a series of objectives to help ease the energy strain, including: increasing the reliability and capacity of the utility systems; updating the systems technology; reducing energy consumption and operating cost; and being environmentally friendly.

An additional goal was to accomplish all of these changes with the least amount of disruption and cost.

See Energy, Page 7



The southern facades of the Kemper Art Museum and Earl E. and Myrtle E. Walker Hall. Also pictured is the Dula Foundation Central Courtyard.

## Imagine that

### Teen first to play video game with brain waves

By TONY FITZPATRICK

A St. Louis-area teenage boy and a computer game have gone hands-off, thanks to a unique experiment conducted by a team of WUSTL neurosurgeons, neurologists and engineers.

The boy, a 14-year-old who suffers from epilepsy, is the first teenager to play a two-dimensional video game, "Space Invaders," using only the signals from his brain to make movements.

Getting subjects to move objects using only their brains has implications toward some day building biomedical devices that can control artificial limbs, for instance, enabling the disabled to move a prosthetic arm or leg by thinking about it.

Many gamers think fondly of "Space Invaders," one of the most popular breakthrough video games of the late '70s. The player controls the motions of a movable laser cannon that moves back and forth across the bottom of the video screen.

Row upon row of video aliens march back and forth across the screen, slowly coming down from the top to the bottom of the screen. The objective is to

prevent any one of the aliens from landing on the bottom of the screen, which ends the game. The player has an unlimited ammunition supply.

The aliens can shoot back at the player, who has to evade, moving left and right. There are lots of levels of play, reflecting the speed at which the aliens descend. The WUSTL subject mastered the first two levels of play using just his imagination.

#### Here's how:

The teenager had a grid atop his brain to record brain surface signals, a brain-machine interface technique that uses electrocorticographic (ECoG) activity — data taken invasively right from the brain surface.

It is an alternative to a frequently used technique to study humans called electroencephalographic activity — data taken non-invasively by electrodes outside the brain on the scalp. Engineers programmed the software to interface with the brain-machine interface system.

Eric C. Leuthardt, M.D., an assistant professor of neurological surgery at the School of Medicine, and Daniel Moran, Ph.D., assistant professor of biomed-

See Game, Page 2

## Cigarette smoking shown to delay tendon-to-bone healing

By JIM DRYDEN

School of Medicine orthopaedic surgery researchers have identified yet another reason to not smoke.

Studying rotator cuff injury in rats, the research team found exposure to nicotine delays tendon-to-bone healing, suggesting this could cause failure of rotator cuff repair following surgery in human patients.

Smoking is implicated in a host of physical problems, from cardiovascular disease to lung disorders. Many people probably don't think about smoking's effects on orthopaedic conditions, but several studies have shown that nicotine interferes with healing of bone fractures and also inhibits bone fusion processes.

Many spine surgeons, for example, won't do certain operations on people who smoke because of the risk of failure. But little is known about the effects of

cigarettes on tendon and ligament healing.

There also are some gaps in medical knowledge about the prevalence of rotator cuff injuries. The rotator cuff is a group of four muscles and their tendons in the shoulder that provide rotation, elevate the arm and stabilize the shoulder joint. Rotator cuff tears involve one or more of the tendons. The injuries are more common as people age and more common in the dominant arm.

The true incidence of the injuries is hard to determine because between 5 percent and 40 percent of people who may have a torn rotator cuff have no accompanying shoulder pain.

What surgeons do know is that rotator cuff repairs can fail in the days and weeks after surgery. Some studies have reported short- to intermediate-term recurrence rates from 30 percent to 90 percent, depending on the size

See Smoking, Page 2



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## Experts on aging, long-term care to speak at School of Social Work

BY CYNTHIA GEORGES

**R**obert L. and Rosalie A. Kane, husband-and-wife professors at the University of Minnesota, will present "Long-term Care Shouldn't Be This Way: Two Perspectives" from 4-6 p.m. Tuesday, Oct. 24, in Brown Hall Lounge at the George Warren Brown School of Social Work.

The lecture is free and open to the public.

The Kanes are preeminent scholars in the field of aging. Together, they have devoted 60 years to the study of aging and have conducted pathbreaking research in geriatrics, health services and long-term care.

They will speak about their personal experiences as caregivers for their own parents, drawing from the context of their scholarship and the larger national scope of long-term care reforms.

Robert Kane, M.D., is a physician and Minnesota Chair in Long-Term Care and Aging in the Division of Health Policy and Management at the School of Public Health.

He directs the Center on Aging and the Minnesota Geriatric Education Center and co-directs the University of Minnesota's Clinical Outcomes Research Center.

The author or editor of more than 30 books and 350 journal articles and book chapters, Robert served on the World Health Organization's Expert Committee on Aging.

He has been distinguished with many awards, including the President's Award from the American Society on Aging, which he shared with Rosalie, the Polisher Award from the Gerontological Society of America and the Enrico Greppi Prize from the Italian Society of Gerontology and Geriatrics.

Robert Kane, with his sister, Joan West, is the co-author of *It Shouldn't Be This Way: The Failure of Long-Term Care*, published in 2005 and based on their experi-



Robert Kane



Rosalie Kane

ences of caring for their parents. That same year, he formed a national advocacy group, Professionals With Personal Experience With Chronic Care.

Rosalie Kane, Ph.D., is a professor in the Division of Health Policy and Management at the School of Public Health. She also serves on the faculties of the Center for Biomedical Ethics, the School of Social Work and the Center on Aging.

Her research centers on long-term care services, organization, policies and financing in settings that include nursing homes, assisted living and home care.

A prolific author and past editor-in-chief of both *The Gerontologist* and *Health and Social Work*, Rosalie serves on several national task forces and committees on aging.

She's been honored with the Kent Award from the Gerontological Association of America and a Robert Wood Johnson Foundation Investigator Award in Health Policy Research.

"This lecture comes at a time when health-care policy is rising in national importance," said Michelle Putnam, Ph.D., WUSTL assistant professor of social work and an expert in aging and disability policy.

"Long-term care is a poorly insured and extremely expensive component of our system. Many of us are or will be engaging in care-giving activities in the future. These issues are relevant and critically important to us all."

For more information, call 935-7573.

## Game

— from Page 1

ical engineering, performed their research on the boy who had the grids implanted so that neurologists and neurosurgeons can find the area in the brain serving as the focus for an epileptic seizure, with hopes of removing it to avoid future seizures.

To do this, the boy and his doctors, Matthew Smyth, M.D., assistant professor of neurosurgery and of pediatrics, and John Zempel, M.D., Ph.D., assistant professor of neurology and of pediatrics, had to wait for a seizure.

### Usin' the noggin

With approval of the patient and his parents and the WUSTL School of Medicine Institutional Review Board, Leuthardt and Moran connected the patient to a sophisticated computer running a special program known as BCI2000 (developed by their collaborator Gerwin Schalk at the Wadsworth Center, New York State Department of Health in Albany) which involves a video game that is linked to the ECoG grid.

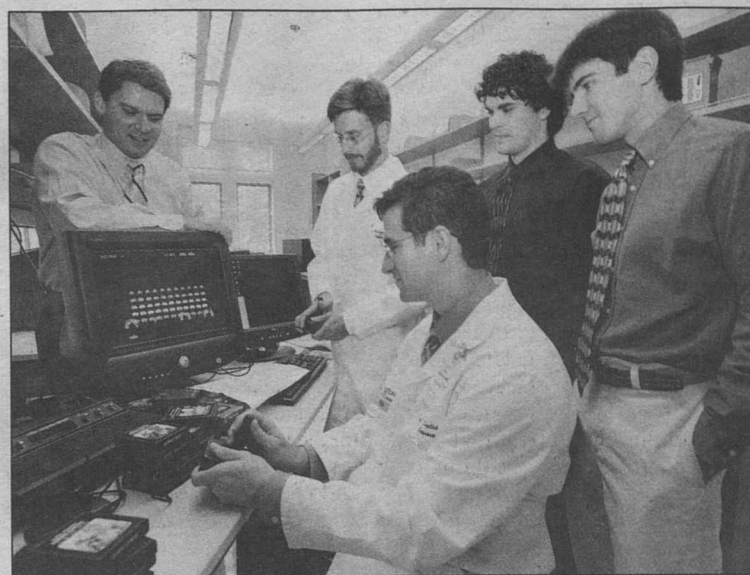
They then asked the boy to do various motor and speech tasks, moving his hands various ways, talking and imagining. The team could see from the data which parts of the brain and what brain signals correlate to these movements.

The doctors asked the boy to play a simple, two-dimensional "Space Invaders" game by actually moving his tongue and hand. He then was asked to imagine the same movements — but not to actually perform them — with his hands or tongue. When he saw the cursor in the video game, he then controlled it with his brain.

"He cleared out the whole level one basically on brain control," Leuthardt said. "He learned almost instantaneously. We then gave him a more challenging version in two dimensions and he mastered two levels there playing only with his imagination."

In 2004, Leuthardt and Moran led a team which was the first to perform this research on four adult patients. The researchers were anxious to get data from a teenager to see if there are any differences between how teens and adults operate.

"It's exciting to be able to look



This team, from left, Daniel Moran, Matthew Smyth, Eric Leuthardt, Nick Anderson and Tim Blakely, enabled a 14-year-old to play a two-dimensional video game using signals from his brain.

**"Doing this is a win-win situation, both for science and the child. We devised this to be enjoyable and entertaining while we get groundbreaking information on the brain."**

ERIC C. LEUTHARDT

at age differences and see what that tells us about the brain," said Moran, who added that the team plans to test more pediatric subjects. "No one has ever seen if brain signals from children are different."

"We'll try to determine if teenagers have different frequency distributions when their cortex becomes active. We might question if the frequency alterations are different — will that make a difference in performance?"

Leuthardt said it is too early to make comparisons between adults and teenagers because they have only one set of teenage data.

"But we observed much quicker reaction times in the boy and he had a higher level of detail of control — for instance, he wasn't moving just left and right, but just a little bit left, a little bit right," he said.

### Teamwork

Graduate students in the School of Engineering and Applied Science played major roles in the accomplishment. Nick Anderson, a doctoral student in biomedical engineering, came up with the idea of using the "Space Invaders" game

to both help the patients pass the time away and garner some very useful, pioneering data. Computer science and engineering master's degree candidate Tim Blakely pulled several all-nighters to program the game into the ECoG system.

"Doing this is a win-win situation, both for science and the child," Leuthardt said. "We devised this to be enjoyable and entertaining while we get groundbreaking information on the brain."

The clinical team also played a significant role in the planning and orchestration of this research. It was of critical importance that these experiments be safe and not interfere with clinical care.

The clinical pediatric portion of the team was led by Smyth and Zempel.

"This really was a symphony of expertise ranging from neurosurgery, neurology, neuroscience, engineering and computer science, which was years in the making. The end result is something we can really be proud of," Leuthardt said.

## Campus Watch

The following incidents were reported to University Police Oct. 11-17. Readers with information that could assist in investigating these incidents are urged to call 935-5555. This information is provided as a public service to promote safety awareness and is available on the University Police Web site at [police.wustl.edu](http://police.wustl.edu).

### Oct. 12

8:27 a.m. — A visitor to the Olin Library reported an unknown female took his dark blue London Fog jacket from the technical room on the first level. The incident occurred between 8:20-8:25 a.m. on this date. Total loss is estimated at \$100.

11:42 a.m. — A person in January Hall reported an unknown person stole \$225 from a cash box kept inside a safe in the University College office. There was no sign of forced entry. The theft occurred

between 9 a.m. Aug. 16 and 9 a.m. Sept. 23.

### Oct. 15

2:34 a.m. — It was reported that unknown persons broke a window to gain entry into a vehicle, which was parked in the Millbrook Parking Garage, and stole the stereo between 10 a.m. Oct. 14 and 2:30 a.m. on this date.

University Police also responded to two larcenies and one report each of fraud, parking violation, found property and motor-vehicle theft.

## Smoking

— from Page 1

of the tear, chronic nature of the injury and the age of the patient, among other factors.

"Especially during the first six weeks after surgery, tissue may be vulnerable to re-injury," said Leesa M. Galatz, M.D., first author of the study and assistant professor of orthopaedic surgery.

"Those early weeks are a time when there's a lot of tissue healing and remodeling occurring, and we're trying to learn whether there may be increased vulnerability to early failure in smokers."

This study, the first to evaluate the effects of nicotine on rotator cuff repair, found that when rats were exposed to nicotine following rotator cuff repair, inflammation persisted for a longer time in the shoulder joint.

That's detrimental to healing. The researchers also noted that there was less cellular proliferation in the rats' surgically repaired shoulders and decreased collagen production, leading to inferior healing.

"When you have an injury and a repair, new cells come in and start to facilitate healing," Galatz said. "When the new cells arrive, they make proteins such as collagen to form the junction between tendon and bone. And in the rats exposed to nicotine, we saw lower cellular proliferation."

The rats also made less type-I

collagen and had different biomechanical properties in their shoulders following rotator cuff repair. Measuring properties called maximum stress and maximum force, the researchers found that shoulder joints in the nicotine-exposed rats were weaker.

"Those changes were most apparent at earlier time points, and shoulder strength tended to equalize between the two groups about 8 weeks after surgery," Galatz said. "But certainly, the tissue was weaker early on and more vulnerable to re-injury."

Galatz and colleagues studied healing in the shoulders of 72 rats following rotator cuff surgery. The researchers implanted tiny, osmotic pumps under the skin of the rats, and those pumps delivered either nicotine or an inactive saline solution. Saline pumps were implanted to ensure that any changes observed between groups of rats resulted from nicotine exposure rather than from having a pump implanted beneath the skin.

In the rats that got nicotine, the pumps maintained nicotine levels in the bloodstream about equivalent to smoking a pack to a pack and a half of cigarettes per day.

"So these would have been heavy smokers," Galatz said. "But another significant aspect about this study is that we did not account for other detrimental chemicals in cigarettes. Rats were not exposed to carbon monox-

ide, tar or the other substances that harm people who smoke.

"So if anything, we may have underestimated the negative effects of cigarette smoking on rotator cuff healing."

Galatz said the study also might underestimate the harmful effects of smoking because rats tend to be better healers than humans and because they were exposed to nicotine for only a few weeks following surgery, whereas people may smoke for many years before surgery, as well as continue smoking following rotator cuff repair.

"Certainly more study is necessary to definitively prove that cigarettes affect humans the same way," she admits. "But I think we have enough evidence to state that nicotine has a negative impact on healing in tendons as well as in bone."

As to how nicotine works to interfere with healing, Galatz said it's still too early to tell.

"We would have to look much more closely to learn exactly what the mechanism is, but blood supply is a potential culprit," she said.

"Nicotine and cigarette smoking inhibit the formation of new blood vessels, and basically, all healing and all repair processes are aided by the formation of new blood vessels that bring in new cells."

"That process is assisted by increases in blood supply that may not happen as efficiently in smokers."

## Record

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## School of Medicine Update

# Surgery corrects vision in kids with neurological disorders

By BETH MILLER

Children with cerebral palsy and other neurological problems often have extremely poor eyesight. Their ability to read, pick up objects and "see" the world is so impaired and complicated to treat that many go untreated, even though they may be legally blind.

Janice Brunstrom, M.D., a Washington University neurologist at St. Louis Children's Hospital, saw firsthand how her patients' poor vision interfered with every aspect of their daily lives.

Having cerebral palsy herself and wanting to help reverse the isolation that many of these children endure because of their poor vision, she approached pediatric ophthalmologist Lawrence Tychsen, M.D., to help devise some solutions.

Tychsen developed specialized testing and now does vision correction, or refractive, surgery on children with cerebral palsy, Down syndrome and neurobehavioral disorders such as autism.

To date, St. Louis Children's Hospital is one of the only U.S. medical centers performing refractive surgery on these children and has the highest volume, operating on about 60 special-needs children a year.

"We work with the most profoundly impaired children who are the most difficult to examine," said Tyche, professor of ophthalmology and visual sciences, of pediatrics and of neurobiology and ophthalmologist-in-chief at St. Louis Children's Hospital. "So we also tend to have the most grateful parents."

Brunstrom said Tyche readily agreed to repairing the vision in these children.

"These are kids who were legally blind and whom everyone had given up on," Brunstrom said. "One by one, he has restored their sight by figuring out what is wrong and what he can fix. He is willing to tackle situations that used to be considered impossible or not worth the time."

The children who are the best candidates for vision correction surgery are those who cannot or will not wear glasses and have blunted social interactions because of their visual impairment. Tyche said that these children suffer a kind of "visual autism."

About 80 percent of children with severe neurological disorders have some kind of vision impairment.

Tyche and his staff perform laser-assisted subepithelial keratectomy, or LASEK, in which the cornea is reshaped with a laser. This technique doesn't require a surgical flap to be cut in the eye and is safer for children, who inevitably rub their eyes after surgery. In addition, the LASEK technique is able to correct much higher degrees of myopia, or nearsightedness, than the LASIK technique (laser-assisted in situ keratomileusis) commonly used on adults. The surgeons also can correct extreme farsightedness.

For children with focusing defects so large that they are beyond the range of laser correction, Ty-

chsen uses other surgical techniques. One of these is implantation of a phakic intraocular lens, leaving the natural lens in place. The other is a lens extraction technique, in which the natural eye lens is removed and replaced with another type of implant.



Tyche

These techniques can improve vision in a child with profound nearsightedness, such as 20/1,500, to nearly 20/20, Tyche said.

Because many of the children Tyche treats are unable to communicate clearly or are uncooperative, he and his team use several noninvasive, electronic techniques to measure eyesight and determine the success of surgery. A computer-recording method measures the improvements that can be achieved in the visual brain while the child is awake. Other instruments take precise measurements before surgery while a child is under anesthesia.

Although the surgeries can make significant improvements in the child's vision and overall quality of life, most laser-treated children will see mild regression in their vision over time, Tyche said. But for most parents, the decision to have their child go through the surgery is relatively simple.

"For special-needs children, there is often no alternative," Ty-

chsen said. "When contemplating what it could mean to the overall development of the child, most parents opt for surgery."

Julie Lawrence is one of Tyche's patients whose life has changed significantly since she had vision correction surgery about three years ago, said her mother, Greta Lawrence.

Julie has Angelman Syndrome, a chromosomal disorder, and was extremely nearsighted with astigmatism.

Because of her autistic tendencies and poor vision, Julie would withdraw into herself. Tyche often reminded the Lawrences that Julie needed vision correction to become interested in things and engaged in the world. However, Greta Lawrence said some of Julie's other doctors discouraged them from having the surgery.

"Because she can't read or do academics, some doctors said it wasn't worth it," Greta Lawrence said tearfully. "But Dr. Tyche always treated her like she was important and thought it would be worthwhile."

Since Tyche performed Julie's surgery, which corrected her vision to "almost perfect," Julie can now recognize her family from across the room and is less restless when in public, Greta Lawrence said. "She's more content to sit and watch what people are doing. If she couldn't see, she wouldn't be doing that."

## Polonsky elected to Institute of Medicine

Election to the academy is among the highest honors U.S. medical scientists can receive

By DIANE DUKE WILLIAMS

Kenneth S. Polonsky, M.D., has been elected to the Institute of Medicine of the National Academy of Sciences, one of the highest honors U.S. medical scientists can receive.

Polonsky was honored for his professional achievement in the health sciences, specifically in the area of diabetes.

The Institute of Medicine serves as a national resource for independent analysis and recommendations on issues related to medicine, biomedical sciences and health.

It was established in 1970 as part of the National Academy of Sciences, which advises the federal government on science and technology issues.

Polonsky is the Adolphus Busch Professor and head of the Milliken Department of Internal Medicine. He also is physician-in-chief at Barnes-Jewish Hospital and a member of the Washington University Faculty Practice Plan board of directors.

A renowned diabetes researcher, Polonsky studies factors that influence the health of pancreatic beta cells, which secrete insulin. Defects in the secretion process and in the hormone's ability to stimulate glucose uptake by cells are hallmarks of noninsulin-dependent (type 2) diabetes.

His studies have revealed that people who are not diabetic but have mild defects in glucose tolerance already have malfunctioning beta cells. He also has demonstrated that one form of diabetes could result from an impairment in beta-cell function that is associated with a defect on chromosome 20.

Polonsky is studying genes that increase the risk for type 2 diabetes and is evaluating drugs that stimulate insulin secretion.

A member of numerous professional societies including the Association of American Physicians and the American Society for Clinical Investigation, Polonsky also has served on national and regional committees for the American Diabetes Association

and other organizations.

He is the author or co-author of more than 230 scientific articles.

Polonsky graduated cum laude with a medical degree from the University of Witwatersrand in Johannesburg, South Africa. He completed an endocrinology fellowship at the University of Chicago's Pritzker School of Medicine in 1978 and then joined the school's faculty in 1981.

In 1990, he was named the Louis Block Professor of Medicine and also served as chief of that institution's endocrinology section and director of its Diabetes Research and Training Center.

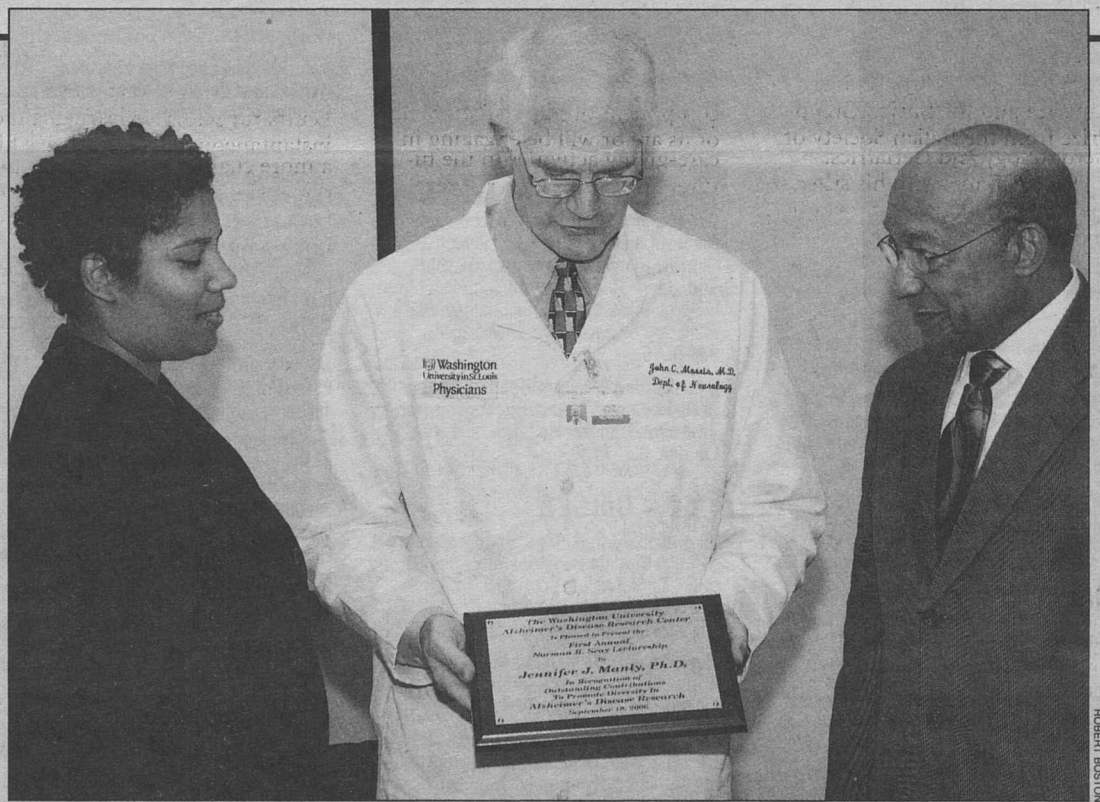
He joined WUSTL in 1999 as the Adolphus Busch Professor and head of the Milliken Department of Internal Medicine.

Polonsky is among 65 members whose elections to the Institute of Medicine were announced by the National Academy of Sciences Oct. 9.

As a member, Polonsky makes a commitment to devote a significant amount of volunteer time on committees engaged in a broad range of health-policy issues.



Polonsky



Word of praise John Morris, M.D. (center), the Harvey A. and Dorismae Hacker Friedman Professor of Neurology and director of the Alzheimer's Disease Research Center at the School of Medicine, presents Jennifer Manly, Ph.D., assistant professor of neuropsychology in neurology at Columbia University, with a plaque recognizing her efforts to promote diversity in Alzheimer's disease research at the first annual Norman R. Seay Lecture. Seay (right), a civil rights leader and an advocate of Alzheimer's disease research, looks on.

## Academia, industry bring future of medicine to public

By CAROLINE ARBANAS

Moving new technology from the laboratory to patients' bedsides takes more than just a clever idea. It often requires the combined expertise of university researchers who develop the technology and industry scientists who understand what it takes to get innovations to the marketplace.

That's exactly what two Washington University scientists had in mind when they created a consortium of experts from academia and industry. Their goal: to bring the promise of new technology to the public for the early detection and treatment of heart disease and cancer.

The Washington University Consortium for Translational Re-

search in Advanced Imaging and Nanotechnology (C-TRAIN) unites under one roof physicists, chemists, engineers, cell biologists, computer software engineers and physicians; the industrial powerhouses Bristol-Myers Squibb Medical Imaging, Philips Medical Systems, IBM Corp., Dow Chemical Co.; and local biotechnology company Kereos. This collaborative, open framework is designed to break down the physical barriers that separate academic and industry scientists and speed the development of more precise imaging agents and targeted therapies.

An opening reception for C-TRAIN will be held Friday, Oct. 20 in the CORTEX building at Forest Park Avenue and Boyle Street from 1:30-3:30 p.m.

The consortium is the vision of Samuel A. Wickline, M.D., and Gregory M. Lanza, M.D., Ph.D. Both are professors of medicine and biotechnology at the School of Medicine and heart specialists at Barnes-Jewish Hospital. Together they developed microscopic beads called nanoparticles that have the potential to revolutionize the way cancer and heart disease are diagnosed and treated. The nanoparticle technology has been proven effective against cancer and cardiovascular disease in laboratory animals; human studies are set to begin later this year.

"C-TRAIN provides a venue for investigators to pursue clinically relevant research in molecular imaging and nanomedicine for the benefit of patients," said Wickline.

"We not only want to collaborate with basic and clinical researchers but develop a fertile environment for transferring technology to industry partners in the St. Louis area and beyond."

The consortium will focus on developing a broad range of technology, including nanotechnology. It is the umbrella organization for more than 40 researchers and staff and is supported by more than \$23 million in federal grants and corporate partnerships.

"Nanotechnology has the potential to dramatically change the way patients are treated," Lanza said. "C-TRAIN's collaborative, multidisciplinary approach is likely to speed our ability to bring nanotechnology and other innovations to the marketplace."



# University Events

## Wong, Satrapi and Strogatz to speak at Assembly Series

BY MARY KASTENS  
AND KURT MUELLER

An actor, a graphic novelist and a mathematician will deliver Assembly Series lectures over the next week.

Tony award winner **B.D. Wong** will give the talk "All the World's a Stage: From Exclusion to Inclusion" at 4 p.m. Monday, Oct. 23, in Graham Chapel.

Wong gained national attention with his Broadway debut starring in *M. Butterfly* in the role of Song Liling. For his performance, Wong won the Tony Award and the Drama Desk Award. Wong's other critically acclaimed musical performances include the revival of *You're a Good Man, Charlie Brown* and Stephen Sondheim's *Pacific Overtures*.

Some of Wong's TV roles include forensic psychiatrist George Huang in the NBC hit "Law and Order: SVU," Father Ray Mukada in "OZ," the sensational HBO production set in a maximum-security prison, and a co-starring role in the 1994 ABC situation comedy, "All American Girl," which featured America's first Asian-American family.

Besides his impressive work in Broadway musicals and his dramatic and comedic work in tele-



Wong



Satrapi



Strogatz

25, in Graham Chapel.

Satrapi's work that has been published in English includes *Persepolis*, *Persepolis 2*, *Embroideries* and the recently released

*Chicken With Plums*. In each, she tells her stories not only with words, but with pictures. These graphic novels, sometimes called comics, represent the fastest growing area of publishing.

Satrapi, who was born in Rasht, Iran, left as a teenager to study in Vienna, Austria, and later to study decorative arts in Strasbourg, France. In 1994, she moved to Paris where she was introduced to l'Atelier des Vosges, home to many of France's comic-book artists. It was there that she was convinced to put her stories and drawings into print.

*Persepolis* is the story of Satrapi's experiences as a youth in Iran living through the Islamic Revolution and the War with Iraq in the 1970s and 1980s. It is a story about an ordinary but also outrageous childhood. *Persepolis* won critical acclaim in France, has received a number of

awards and has been compared favorably to Art Spiegelman's *Maus*. *Persepolis 2* is the second half of her story.

In *Chicken With Plums*, Satrapi chronicles the last eight days in the life of a great uncle who, according to family lore, decided to lie down and die after his wife destroyed his musical instrument, a tar, over her knee.

Satrapi lives in Paris where her illustrations appear regularly in newspapers and magazines. Her work also appeared this summer in *The New York Times*. She is at work on an animated film adaptation of *Persepolis*.

Cornell University mathematician **Steven Strogatz** will speak on "Sync: The Emerging Science of Spontaneous Order" at 4 p.m. Thursday, Oct. 26, in Rebstock Hall, Room 215.

Widely recognized for his groundbreaking discoveries in chaos and complexity theory, Strogatz is a pioneer in the cutting-edge science of synchrony, the hidden order that governs the rhythms of nature, which can be seen in fireflies flashing in unison, sleep patterns, the behavior of cancer cells, consciousness arising from the interplay of millions of brain cells, riots and fads.

It also can be seen in inani-

mate systems, such as traffic-flow patterns, electrons in a superconductor and quantum mechanics.

His 2003 book, *Sync: The Emerging Science of Spontaneous Order*, outlines his research on how individual members within a complex system can influence a spontaneous reaction affecting the behavior of the entire group.

His work has been featured in many publications, including *Nature*, *Science*, *Scientific American*, *Newsweek*, *The New York Times*, *Die Zeit* and broadcast on BBC radio, National Public Radio, CBS News and numerous other mass media outlets.

Strogatz is a professor in the Department of Theoretical and Applied Mechanics and the Center for Applied Mathematics at Cornell University. He earned a bachelor's degree from Princeton University in 1980, bachelor's and master's degrees from Cambridge University in 1982 and 1986, and a doctorate in applied mathematics from Harvard University in 1986.

He taught at Massachusetts Institute of Technology and at Harvard before joining the Cornell faculty in 1994.

These events are free and open to the public. For more information, call 935-4620 or go online to [assemblyseries.wustl.edu](http://assemblyseries.wustl.edu).

## How to Buy a Telescope • Navajo Hip-Hop • Self-Determination

"University Events" lists a portion of the activities taking place Oct. 19-Nov. 1 at Washington University. Visit the Web for expanded calendars for the Danforth Campus ([calendar.wustl.edu](http://calendar.wustl.edu)) and the School of Medicine ([medschool.wustl.edu/calendars.html](http://medschool.wustl.edu/calendars.html)).

### Exhibits

**Caught! Modern Dance Photographs by Barbara Morgan.** Through Dec. 21. Olin Library, Lvl. 1, Ginkgo Rm. 935-5495.

**Eyes on the Prize 1 & 2: Documenting the Civil Rights Movement.** Through Dec. 21. Olin Library, Lvl. 1, Grand Staircase Lobby. 935-8679.

**Faith and Politics by John C. Danforth.** Through Oct. 31. Olin Library Lobby. 935-6626.

**Lilly Oncology on Canvas.** Oct. 23-27. (Presented by Eli Lilly and Co.) Siteman Cancer Center, West County Office, 969 N. Mason Rd. 936-8270.

### Film

#### Wednesday, Oct. 25

**7 p.m. Japanese Film Series.** *Dark Water.* Nakata Hideo, dir. Sponsored by Asian & Near Eastern Languages & Literatures. McMillen Hall, Rm. 149. 935-5110.

### Lectures

#### Thursday, Oct. 19

**Noon. Genetics Seminar Series.** "Genetic Analysis of Late-onset Alzheimer's Disease." Alison Goate, prof. of genetics in psychiatry. McDonnell Medical Sciences Bldg., Rm. 823. 362-2139.

**2:30 p.m. Mechanical & Aerospace Engineering Seminar.** "Computational Materials Science of Structural and Functional Liquid Crystals." Alejandro Rey, prof. of chemical engineering, McGill U. (Refreshments immediately following, Jolley Hall, Rm. 305.) Cupples II Hall, Rm. 100. 935-6047.

**4 p.m. Assembly Series.** Performing Arts Dept. Lecture. Bonnie Oda Homsey, former principal dancer, American Repertory Dance Company. Women's Bldg. Formal Lounge. 935-5285.

**4 p.m. Chemistry Seminar.** "Ferromagnetic Metal/Compound Semiconductor Heterostructures: Growth, Interfacial Reactions and Spin Injection." Christopher Palmstrom, prof. of chemical engineering & material sciences, U. of Minn. McMillen Hall, Rm. 311. 935-6530.

**4 p.m. Ophthalmology & Visual Sciences Seminar.** "Digital 3-D Reconstruction of the Normal and Early Glaucomatous Monkey Optic Nerve Head." Claude Burgoyne, senior scientist and research dir., Devery Eye Inst. Maternity Bldg., Rm. 725. 362-4179.

**4:15 p.m. Earth & Planetary Sciences Colloquium.** "Molecular Evidence for Radical Changes in Ocean Chemistry, Globally, Across the Permian Triassic Boundary." Roger Summons, prof. of geobiology, Mass. Inst. of Technology. Earth & Planetary Sciences Bldg., Rm. 203. 935-5610.

**8 p.m. Writing Program Reading Series Lecture.** Steven Millhauser, Visiting Hurst Professor. Duncker Hall, Rm. 201, Hurst Lounge. 935-7130.

#### Friday, Oct. 20

**7:30 a.m.-3:30 p.m. Medicine Conference.** "Annual Bi-state Regional Infectious Disease Conference." Cost: \$75. St. Louis Hilton Airport, 10330 Natural Bridge Rd. For information and to register: 996-5584.

**9 a.m. Research Financial Management Series for Research Administrators.** For location and to register: 747-6273.

**9:15 a.m. Pediatric Grand Rounds.** "Beam Me Up Scotty: Glucose Transporters and the Metabolic Syndrome." Paul Hruz, asst. prof. of pediatrics. Clopton Aud., 4950 Children's Place. 454-6006.

**10:30 a.m. Boeing Center for Technology, Information and Manufacturing Operations and Manufacturing Management Seminar.** "Lead-time Based Supply Chain Contracts and Coordination." Chester Chambers, visiting asst. prof. of operations and manufacturing management. Simon Hall, Rm. 241. 935-5577.

**Noon. Cell Biology & Physiology Seminar.** "Mechanisms of Non-visual Ocular Photoreception." Russell Van Gelder, assoc. prof. of ophthalmology & visual sciences. McDonnell Medical Sciences Bldg., Rm. 426. 747-4233.

**7:30 p.m. Saint Louis Astronomical Society Meeting.** "How to Buy a Telescope." McDonnell Hall, Rm. 162. 935-4614.

#### Monday, Oct. 23

**8 a.m.-5 p.m. St. Louis STD/HIV Prevention Training Center CME Course.** "STD Intensive." (Continues 8 a.m.-5 p.m. Oct. 24 & 25.) Cost: \$125. For location and to register: 747-1522.

**Noon. Work, Families and Public Policy Brown Bag Seminar Series.** "Income From Wealth and Income From Labor: The Rising Importance of Accumulated Wealth for Economic Well-being." Timothy Smeeding, prof. of economics and public administration, Syracuse U. Eliot Hall, Rm. 300. 935-4918.

**4 p.m. Assembly Series.** Asian Multicultural Council Lecture. "All the World's a Stage: From Exclusion to Inclusion." B.D.

Wong, actor. Graham Chapel. 935-5285.

**4 p.m. Foreign Language Learning Colloquium Series.** "Extensive Reading Belongs in the Foreign Language Curriculum." Richard Day, prof. and chair of second language studies, U. of Hawaii. Co-sponsored by Asian & Near Eastern Languages & Literatures, Germanic Languages & Literatures and Romance Languages & Literatures. Lab Sciences Bldg., Rm. 300. 935-5175.

**4 p.m. Immunology Research Seminar Series.** "HIV-specific Immune Responses — Lessons for Vaccines." Andrew McMichael, prof. of molecular medicine, U. of Oxford, England. Farrell Learning & Teaching Center, Connor Aud. 362-2763.

**4 p.m. Physics Lecture.** "Probing Structure and Bonding in Hydrogen-storage Materials by Combined Neutron-scattering Techniques and First-principle Calculations." Terry Udovic, Center for Neutron Research, National Institute of Standards and Technology. (3:45 p.m. coffee.) Compton Hall, Rm. 241. 935-6276.

**5:30 p.m. Cardiac Bioelectricity & Arrhythmia Center Seminar Series.** "Device Therapy in Pediatrics: Millivolts to Kilovolts." Edward Rhee, asst. prof. of pediatrics. (5:30 p.m. reception.) Whitaker Hall, Rm. 218. 935-7887.

#### Tuesday, Oct. 24

**8 a.m.-4:30 p.m. Center for the Application of Information Technology (CAIT) Three-day Workshop.** "Project Management Simulation." (Continues 8 a.m.-4:30 p.m. Oct. 25 & 26.) Cost: \$1500; reduced fees available for CAIT member organizations. CAIT, 5 N. Jackson Ave. To register: 935-4444.

**Noon. Molecular Microbiology & Microbial Pathogenesis Seminar Series.** "Genetics of SARS — Coronavirus Pathogenesis." Ralph Baric, prof. of epidemiology, microbiology and immunology, U. of N.C. Cori Aud., 4565 McKinley Ave. 747-2132.

**Noon. Program in Physical Therapy Research Seminar.** Sara Scholtes, doctoral candidate in movement science. 4444 Forest Park Blvd., Lower Lvl., Rm. B108. 286-1400.

**1 p.m. Multidisciplinary Clinical Research Career Development Program Seminar.** "Obesity Etiology and Policy Effects: Use of Multilevel Methods." Ross Brownson, prof. of community health in epidemiology, St. Louis U. Center for Clinical Research Training, Conference Rm. 1. 454-8255.

**4 p.m. Anthropology Colloquium.** "Haash Deesh"el: Navajo Hip-hop and the Emergence of the 'Glocal.'" Anthony Webster, asst. prof. of anthropology, Southern Ill. U.-Carbondale. McMillan Hall, Rm. 149. 935-5252.

**4 p.m. George Warren Brown School of Social Work Lecture.** "Long-term Health Care Shouldn't Be This Way: Two Perspectives." Rosalie Kane, prof. of public health, U. of Minn., and Robert Kane, prof. and

Minnesota Chair in Long-Term Care and Aging, U. of Minn. Brown Hall Lounge. 935-7573.

#### Wednesday, Oct. 25

**8:30 a.m.-noon. Career Development Training Program.** "Influential Leadership." Open to WUSTL directors, managers and supervisors. Cost: \$50. Becker Medical Library, Rm. 601A. Register online at [hr.wustl.edu](http://hr.wustl.edu).

**11 a.m. Assembly Series.** Marjane Satrapi, writer/artist. Graham Chapel. 935-5285.

**4 p.m. Biochemistry & Molecular Biophysics Seminar.** "Structural Biology of Pilus Biogenesis and Bacterial Attachment." Gabriel Waksman, prof. of structural molecular biology, U. College London-Birkbeck, England. Cori Aud., 4565 McKinley Ave. 362-4152.

**4 p.m. Biology & Biomedical Sciences "Frontiers in Human Pathobiology" Lecture Series.** "Assembly and Destruction of von Willebrand Factor in Human Disease." Evan Sadler, prof. of medicine. Farrell Learning & Teaching Center, Holden Aud. 362-4806.

#### Thursday, Oct. 26

**8 a.m. Medicine Grand Rounds.** "Prevention of Colorectal Cancer." Robert Sandler, Nina C. & John T. Sessions Distinguished Professor and chief of gastroenterology and hepatology, U. of N.C. Clopton Aud., 4950 Children's Place. 362-2031.

**Noon. Genetics Seminar Series.** "Genetics and Evolution in Sticklebacks." Catherine Peichel, Div. of Human Biology, Fred Hutchinson Cancer Research Center, Seattle. McDonnell Medical Sciences Bldg., Rm. 823. 362-2139.

**2:30 p.m. Mechanical & Aerospace Engineering Seminar.** "Flocs, Fractals, and Fly Ash: How Does This Fit Into the PMP Program at NSF?" Judy Raper, dir., particulate and multiphase processes, National Science Foundation. (Reception follows, Jolley Hall, Rm. 305.) Cupples II Hall, Rm. 100. 935-6047.

**4 p.m. Assembly Series.** Thomas Hall Lecture. "Sync: The Emerging Science of Spontaneous Order." Steven Strogatz, prof. of theoretical and applied mechanics, Cornell U. Rebstock Hall, Rm. 215. 935-5285.

**4 p.m. Chemistry Lecture.** Annual Joseph W. Kennedy Memorial Lectures. "Molecular Nanoscience and Nanotechnology — Why What's Small Is Big." Mark Ratner, Morisson Professor of Chemistry and prof. of materials science & engineering, Northwestern U. (3:45 p.m. coffee, Lab Sciences Bldg., foyer.) Lab Sciences Bldg., Rm. 300. 935-6530.

**4:30 p.m. Germanic Languages and Literatures Reading.** "Exercises in Being Jewish: Poems and Prose." Esther Dischereit, author. Co-sponsored by the Dept. of Jewish & Near Eastern Languages and Literatures. Duncker Hall, Rm. 201, Hurst

Lounge. 935-5106.

**6:30 p.m. Architecture Lecture Series.** "The Practice of Work: From Silence to Speech." Ann Hamilton, sculptor, prof. of art, Ohio State U. Brown Hall, Rm. 100. 935-9300.

#### Friday, Oct. 27

**9:15 a.m. Pediatric Grand Rounds.** "Maslow and Self-actualized Erythrocytes: Vascular Control and the Secret Life of Hemoglobin." Allan Doctor, assoc. prof. of pediatrics. Clopton Aud., 4950 Children's Place. 454-6006.

**10:30 a.m. Boeing Center for Technology, Information and Manufacturing Operations and Manufacturing Management Seminar.** "Strategic Customer Behavior, Commitment and Supply Chain Performance." Fugiang Zhang, asst. prof. of operations and design technologies, U. of Calif., Irvine. Simon Hall, Rm. 241. 935-5577.

**Noon. Cell Biology & Physiology Seminar.** "Theme and Variations in Notch Signaling: The Vertebrate Kidney and Somite Tell Their Story." Raphael Kopan, prof. of molecular biology & pharmacology and of internal medicine. McDonnell Medical Sciences Bldg., Rm. 426. 362-6823.

**Noon. Gastrointestinal Research Conference.** "Epidemiologic Studies of Colon Cancer Precursors." Robert Sandler, Nina C. & John T. Sessions Distinguished Professor and chief of gastroenterology and hepatology, U. of N.C. Clinical Sciences Research Bldg., Rm. 901. 362-2031.

**2 p.m. Chemistry Lecture.** Annual Joseph W. Kennedy Memorial Lectures. "Molecular Transport Junctions — Mechanisms and Behaviors." Mark Ratner, Morisson Professor of Chemistry and prof. of materials science & engineering, Northwestern U. McMillen Lab., Rm. 311. 935-6530.

#### Monday, Oct. 30

**8:30 a.m.-4 p.m. Center for the Application of Information Technology (CAIT) Two-day Workshop.** "Take Action: Contribute to Your Firm as a High-impact IT Professional." (Continues 8:30 a.m.-4 p.m. Oct. 31.) Cost: \$1195; reduced fees available for CAIT member organizations. CAIT, 5 N. Jackson Ave. For alternate times and to register: 935-4444.

**4 p.m. Condensed Matter/Materials & Biological Physics Seminar.** "Carbon Nanotube Nanofluidics." Olga Bakajin, chemistry and materials science director, Lawrence Livermore National Labs, Calif. (3:45 coffee.) Compton Hall, Rm. 241. 935-6276.

**4 p.m. Immunology Research Seminar Series.** "Signaling by Receptors With Two Transmembrane Domains." Timothy Springer, Latham Family Professor of Pathology, Harvard U. Farrell Learning & Teaching Center, Connor Aud. 362-2763.

**5:30 p.m. Cardiac Bioelectricity & Arrhythmia Center Seminar Series.** "Therapeutic Ultrasound." Achi



# Escape from the ordinary; explore world through the Travel Lecture Film Series

By BARBARA REA

The popular Travel Lecture Film Series, brought to campus each year courtesy of the Washington University Alumni Association, returns this season with eight travelogues that cover the world.

Created by some of the most esteemed artists in the industry, the films feature gorgeous scenery and great storytelling.

The travelogues can be seen at 6 p.m. and 8:30 p.m. the first Friday of each month in Graham Chapel, unless otherwise noted. Single tickets are available at the door for \$5 per person. The series' schedule for 2006-07 follows.

**Nov. 3: Denmark & Sweden — the Kingdoms of Scandinavia.** Filmmaker Jim McDonald emphasizes the dynamic relationship of the land with the Baltic and North seas, and conjures up images of ancient Vikings as he journeys through these Scandinavian countries.

**Dec. 1: Hawaii Paradise.** December is a perfect time to enjoy beautiful Hawaii via Dennis Burkhardt's film. No matter the weather here, it's always a perfect tropical day in Hawaii.

**Jan. 5: Bringing Home Sardinia: Italy's Mediterranean Isle.** The sunny Mediterranean is a perfect stop. Featuring sculpted hillsides and crashing waves along the coastline, Steve McCurdy shows why Sardinia is a favorite stop for world travelers.

**Feb. 2: Hello! Louisiana.** Folk musicians Monty and Marsha Brown bring the unique mix of French, Spanish and African cultures to life in this film featuring the "Pelican State." Discover the allure of this special state.

**March 2: Inside Iraq: The Untold Stories.** Step past the news cameras and experience the real Iraq with this special film by Mike Shiley. This stark, moving exposé will add a new dimension to understanding this fascinating country.

**April 13: Rails Across Russia — St. Petersburg to the Black Sea.** Travel 8,500 miles across this massive land and through eight time zones via the Great Siberian Railway to experience Russia, from its great city of St. Petersburg to the Black Sea. The film, by Mary Lee and Sid Nolan, will be shown in the Arts & Sciences Laboratory Sciences Building, Room 300.

**May 4: 10 Questions for the Dalai Lama.** If you could ask the Dalai Lama any question, what would it be? Rick Ray had 10 to ask, which are recorded in a documentary featuring the Tibetan holy man. This glimpse into the wise man's mind concludes this year's series.

(Due to deadlines, this story could not be published before the first program, *Route 66 Revisited: The Return Trip*, was shown Oct. 6.)

For more information on programs, costs and registration procedures, contact Liz McCandless at 935-5212.

## Court of Appeals to hear arguments Oct. 24

By CYNTHIA GEORGES

The School of Law will host a special session of the Missouri Court of Appeals, Eastern District, from 9:30-11 a.m. in the Bryan Cave Moot Courtroom in Anheuser-Busch Hall.

The panel of judges will hear oral arguments in three cases: Joanne Zacharewicz et al. v. Sarah Hanly et al., a property dispute over fences in a subdivision; BMK Corp. v. The Clayton Corp., a contract dispute that resulted in a \$1.2 million jury verdict; and

State of Missouri v. Ervell Hoover, the criminal appeal of a father convicted for his role in the shooting death of his daughter's abusive husband.

The judges on the panel are the Honorable Booker T. Shaw, the Honorable Lawrence E. Mooney and the Honorable Patricia L. Cohen. The attorneys for the cases will have about 15 minutes each to argue their sides. A Q&A on judicial procedure and an informal Q&A on judicial clerkships will follow, ending at about 11:30 a.m.

The court periodically holds sessions in law schools as part of an educational program.

To limit the amount of disturbances to the proceedings, visitors are asked to enter and exit the courtroom only during breaks between each attorney's oral argument.

Case briefs for the oral argument session will be on temporary reserve in the law school's library.

For more information, call 935-6430 or go online to [law.wustl.edu](http://law.wustl.edu).

Ludomirsky, Louis Larrick Ward Professor of Pediatrics and Biomedical Engineering. (5 p.m. reception.) Whitaker Hall, Rm. 218. 935-7887.

**7 p.m. Architecture Lecture Series.** Alex Wall, prof. of urban design, U. of Karlsruhe, Germany. Lab Sciences Bldg., Rm. 300. 935-9300.

### Tuesday, Oct. 31

**Noon. Molecular Microbiology & Microbial Pathogenesis Seminar Series.** "Polymicrobial Infections and Pulmonary Exacerbations in Cystic Fibrosis: From Bedside to Bench (and Back Again)." Michael Surette, prof. and Canada Research Chair in microbial gene expression, Dept. of Microbiology & Infectious Diseases, U. of Calgary. Cori Aud., 4565 McKinley Ave. 286-2891.

**1 p.m. Multidisciplinary Clinical Research Career Development Program Seminar.** "Clinical Research and Obesity." Samuel Klein, William H. Danforth Professor of Medicine and Nutritional Science. Center for Clinical Research Training, Conf. Rm. 1. 454-8255.

**3 p.m. School of Law "Access to Justice" Public Interest Law Speaker Series.** "Has Modern Complex Litigation Outgrown the Federal Rules of Civil Procedure? The Case of Antitrust." Richard Epstein, James Parker Hall Distinguished Service Professor of Law, U. of Chicago. Anheuser-Busch Hall. 935-4958.

### Wednesday, Nov. 1

**8:30 a.m.-4 p.m. Center for the Application of Information Technology (CAIT) One-day Workshop.** "The Business-IT Partnership: Delivering Business Results." Cost: \$900; reduced fees available for CAIT member organizations. To register: 935-4444.

**11 a.m. Assembly Series. Black Arts & Sciences Lecture.** "Self-determination: Where Do We Begin?" bell hooks, author. Graham Chapel. 935-5285.

**Noon. Sam Fox School Brown Bag Lunch Discussion Series.** Sabine Eckmann, museum dir. and curator. Kemper Art Museum, Rm. 104. 935-4523.

**4 p.m. Biology & Biomedical Sciences "Frontiers in Human Pathobiology" Lecture Series.** Louis Muglia, prof. of pediatrics. Farrell Learning & Teaching Center, Holden Aud. 362-4806.

## Music

### Thursday, Oct. 26

**8 p.m. Jazz at Holmes.** Peter Martin, pianist, and Maurice Carnes on drums. Ridgley Hall, Holmes Lounge. 935-4841.

## On Stage

### Tuesday, Oct. 24

**7 p.m. School of Medicine Presentation.** *Corpus Delicti: Just Desserts.* Local Infinites Visual Theater. (Also Oct. 25, same time.) Co-sponsored by the Center for the Study of Ethics & Human Values and the Humanities Program in Medicine. Clopton Aud., 4950 Children's Place. To reserve seating: 454-7116.

### Friday, Oct. 27

**8 p.m. Performing Arts Dept. Presentation.** *Fiddler on the Roof.* Jeffery Matthews, dir. (Also 8 p.m. Oct. 28, Nov. 3 & 4; 2 p.m. Oct. 29 & Nov. 5.) Cost: \$15, \$9 for students, children, seniors, WUSTL faculty & staff. Edison Theatre. 935-6543.

## Sports

### Thursday, Oct. 19

**7 p.m. Volleyball vs. U. of Mo.-St. Louis.** Athletic Complex. 935-4705.

**7:30 p.m. Men's soccer vs. Greenville College.** Francis Field. 935-4705.

### Saturday, Oct. 21

**Noon. Football vs. Case Western Reserve U.** Francis Field. 935-4705.

### Monday, Oct. 23

**7:30 p.m. Men's soccer vs. Principia College.** Francis Field. 935-4705.

### Friday, Oct. 27

**5 p.m. Women's soccer vs. Brandeis U.** Francis Field. 935-4705.

**7:30 p.m. Men's soccer vs. Brandeis U.** Francis Field. 935-4705.

### Saturday, Oct. 28

**Noon. Football vs. Carnegie Mellon U.** Francis Field. 935-4705.

### Sunday, Oct. 29

**11 a.m. Women's soccer vs. N.Y.U.** Francis Field. 935-4705.

**1:30 p.m. Men's soccer vs. N.Y.U.** Francis Field. 935-4705.

## Worship

### Saturday, Oct. 28

**4:30 p.m. Catholic Mass.** Sponsored by the Catholic Student Center. Fontbonne U. Chapel. 935-9191.

### Sunday, Oct. 29

**11 a.m. Catholic Mass.** Sponsored by the Catholic Student Center. Fontbonne U. Chapel. 935-9191.

**9 p.m. Catholic Mass.** Sponsored by the Catholic Student Center. Fontbonne U. Chapel. 935-9191.

## And more...

### Thursday, Oct. 19

**4 p.m. University Libraries Panel Discussion.** "Re-imagining Motion: Martha Graham and Barbara Morgan." Women's Bldg. Formal Lounge. 935-5495.

### Wednesday, Oct. 25

**Noon. Post-Assembly Series Student Discussion.** Sponsored by the Center for the Study of Ethics & Human Values. To register: 935-9358.

### Thursday, Oct. 26

**8 p.m. Writing Program Reading Series.** Readings from the work of late faculty member Charles Newman. Duncker Hall, Rm. 201, Hurst Lounge. 935-7130.

### Wednesday, Nov. 1

**Noon. Post-Assembly Series Student Discussion.** Sponsored by the Center for the Study of Ethics & Human Values. To register: 935-9358.

## Business faculty to deliver insights at Thought Leadership conference

By SHULA NEUMAN

For the second year, the Olin School of Business will conduct a conference that exposes area professionals to usable management concepts derived from Olin faculty research.

The conference, "Thought Leadership at Olin: Innovative Ideas Applied to Business," will take place from 8 a.m.-noon Thursday, Oct. 26, at the Charles F. Knight Executive Education Center.

"Executives get a glimpse through the backdoor of the research center — which gives them cutting-edge practices and insights," said Ken Bardach, associate dean and the Charles and Joanne Knight Distinguished Director of Executive Programs.

He said the conference is designed for individuals in positions that enable them to apply breakthrough research in their jobs, such as executives, senior and mid-level managers and human-resource directors.

Participants in last year's conference said it was extremely beneficial.

"There were several presentations on timely issues applicable to my industry," said Lori Lewis, Ph.D., director of organizational development for Enterprise Bank & Trust. "What I enjoyed most were the ones that compelled me to think

ahead about how to grow and develop leaders to meet future challenges."

David Butler, E.M.B.A. '03, said last year's conference was thought-provoking, engaging and affordable. He also enjoyed the networking aspects.

"The conference provided a great opportunity to hear about innovative work and meet alumni, faculty and members of the St. Louis business community," said Butler, president of Heartland Innovation LLC.

This year's program will feature a plenary session, "Innovation for Profitable Growth," delivered by Jackson Nickerson, Ph.D., professor of organization and strategy, and Todd Zenger, Ph.D., the Robert and Barbara Frick Professor of Business Strategy.

The session will introduce a new framework for managing the innovating-for-growth process, including guidelines for selecting which opportunities to pursue, organizing people to innovate and capturing value from the innovations.

The conference will offer six breakout sessions in two time slots. Topics include trust and mistrust in organizations, managing global supply chain risks and innovation strategy.

For more information, contact 935-6608.

## Sports

### Football team regains Founder's Cup with win

The football team regained the Founder's Cup with a 26-7 victory at the University of Chicago Oct. 14.

The Bears defense forced three Chicago turnovers in the win and held the Maroons to negative-two yards rushing. Chicago (2-3, 0-1 UAA) entered the game averaging 221.3 yards per game, the 18th best mark in Division III.

Sophomore Brent Sensenich recovered a fumble and scampered 31 yards to the Chicago 9-yard line. Two plays later, senior DaRonne Jenkins scored from six yards out for his fifth TD of the season to make it 6-0.

Senior Pat McCarthy connected with senior Nick Lizanich on a 45-yard strike to make it 12-0; the Bears then took the second-half kickoff and drove 67 yards on 12 plays for their third touchdown. Junior Gabe Murphy capped the drive with an 8-yard touchdown run to extend the lead to 19-0.

Senior Joe Shaughnessy intercepted Chicago quarterback Matt Rinklin and returned it 52 yards for a touchdown with 10:45 left in the fourth quarter to seal the victory.

### Women's soccer keeps winning streak alive

The No. 13 women's soccer team extended its winning streak to 10 games with two UAA road victories last weekend. On Oct. 13, sophomore Caitlin Malone knocked in a rebound in the 56th minute to lead the Bears to a 1-0 win at Case Western Reserve.

WUSTL then recorded its biggest win of the season with a 2-0 upset at No. 10 University of Rochester Oct. 15.

In the 20th minute, senior MeghanMarie Fowler-Finn sent home a rebound off a free kick from freshman Libby Held for the first goal.

Held then scored her first career goal in the 34th minute as she booted a 38-yard free kick from the right wing.

### Women runners win Oshkosh Invite; men 8th

The No. 3 women's cross country team took first place (38 points) out of 11 teams at the UW-Oshkosh Invitational Oct. 14. The men placed eighth out of 19 teams with 222 points.

Senior Beth Herndon won the individual 6K run in 21:55 to pace the Bears. On the men's side, junior Jesse McDaniel finished the 8K run in 25:24.02 for 26th place.

### Volleyball undefeated in UAA with four wins

The No. 2 volleyball team (23-1, 7-0 UAA) won five matches last week, including two straight five-game thrillers.

The Bears rallied past Webster University, 3-2, Oct. 10 despite facing eight match points in the fourth game before winning, 41-39.

On Oct. 14, WUSTL opened the UAA Round Robin No. 2 in Chicago against No. 17 Emory University. After trailing 3-1 to open the fifth game, the Red and Green closed out the match, 15-13.

The Bears then blanked Brandeis University, Carnegie Mellon University and Rochester, all 3-0.

### Men's soccer upends No.15 Case Western

The Bears (7-3-2, 1-2-1 UAA) opened the weekend Oct. 13 with a 2-0 win at No. 15 Case Western Reserve University.

Two days later, WUSTL tied No. 24 Rochester.

### Watts places third at ITA Division III nationals

Freshman tennis player John Watts posted a 6-1, 6-0, win against Alex Scott of Middlebury College in the third-place match at the ITA Division III Singles Championship.

Watts posted a 2-6, 6-1, 6-3 win against Phalkun Mam of Whitman College before falling to No. 1 Michael Goodwin of Emory, 3-6, 6-3, 1-6 in the semifinals.



## WUSTL dedicates Newman Money Museum

BY LIAM OTTEN

**E**ric P. Newman is one of the foremost American numismatists of the 20th and 21st centuries. On Oct. 25, WUSTL will dedicate a state-of-the-art numismatics facility in his honor.

The 3,000-square-foot Newman Money Museum, housed within the new Mildred Lane Kemper Art Museum, features items drawn from Newman's renowned collection as well as a numismatics library and workspace for scholars. Displays survey the history of coins and paper money from their beginnings and to the present day, as well as the relationship between money, society, culture and commemoration and related issues such as production, inflation and counterfeiting.

"Mr. Newman's interests are extremely broad, though his primary area of focus has been Colonial and early American money," said Tom Serfass, curator of the Newman collection since 1990.

Several exhibits document the legacy of Benjamin Franklin,

a central figure in the development of American Colonial paper money. For example, in the 1730s, Franklin helped curb widespread counterfeiting through his invention of "nature printing," in which bills were printed with intricate leaf patterns.

Exhibits also will explore the lasting influence of Spanish specie coinage, which was widely used until the mid-19th century. For example, the Spanish peso — also nicknamed the Spanish milled dollar or "piece of eight" — was comprised of eight reals, which Colonists often physically cut apart ("made change") using a hatchet.

"Two reals, or two bits, equaled a quarter of a dollar," Serfass said. "That's where the more modern terminology comes from. When the Colonies started printing their own monies, they often read 'Redeemable in Spanish Milled Dollars.' After the American Revolution it was only natural to keep using the same vocabulary."

Other topics include the depiction of women and African-Americans on money. For example, Serfass points out that between 1881 and 1898 U.S. paper money bore the signature of Blanche K. Bruce

(1841-98), registrar of the U.S. Treasury and the first African-American to serve a full term in the U.S. Senate.

Also on view will be displays about the creation of money, from conception and initial design sketches through coinage and engraving and final production; an extensive collection of coin counters and changers; rare examples of printing errors; and a selection of "Hard Times tokens," a form of non-governmental copper coinage popular during money shortages accompanying the 1837-44 recession.

Newman is perhaps best known for his pioneering study *The Early Paper Money of America* (1967), which remains the standard work on the subject and is now entering its fifth edition. Other written works include *The 1776 Continental Currency Coinage: Varieties of the Fugio Cent* (1952), *The Fantastic 1804 Dollar* (1962) and *U.S. Coin Scales and Counterfeit Coin Detectors* (2000). He was inducted into the American Numismatic Association's Hall of Fame in 1986.

For more information, call 935-9595.

## Kemper Art Museum to open inaugural exhibitions Oct. 25

Internationally renowned art collection gets first permanent exhibition galleries in 100 years

BY LIAM OTTEN

**O**ver the last 125 years, WUSTL has built one of the nation's finest university art collections by focusing primarily on the acquisition and display of contemporary work. Beginning next week, WUSTL will showcase that acclaimed collection in its new Mildred Lane Kemper Art Museum, designed by world-renowned architect Fumihiko Maki.

The Kemper Art Museum will open from 4:30-8 p.m. Wednesday, Oct. 25, with three special exhibitions:

- *[Grid<>Matrix]*, the first installment in the series "Screen Arts and New Media Aesthetics."
- *Models and Prototypes*, the inaugural show in the "Focus" series, which explores works from the collection in new interpretive contexts.
- *Pure Invention: Tom Friedman*, featuring work by the ac-

claimed sculptor and WUSTL alumnus.

All three remain on view through Dec. 31. Also debuting Oct. 25 is a new installation of the museum's permanent collection; and *Pressing Issues: The Cultural Agency of Prints*, the first display in the museum's Teaching Gallery.

All exhibitions are free and open to the public. Hours are 11 a.m.-6 p.m. Mondays, Wednesdays and Thursdays; 11 a.m.-8 p.m. Fridays; and 11 a.m.-6 p.m. Saturdays and Sundays. The museum is closed Tuesdays.

"The new museum building offers tremendous potential as an active, energetic and stimulating interface between the praxis and interpretation of art and design — the making of art and its critical analysis," said Sabine Eckmann, the museum's director and chief curator.

The installation in the Bernoudy Permanent Collection Gallery traces how modern and contemporary artists — in the face of radical social, political, economic and technological changes — have developed new concepts of artistic identity while negotiating the shifting relationship between subject and external world in new and salient ways.

Sections focus on the genres of landscape, portraiture, abstraction and artworks that engage the everyday, with each highlighting a range of artistic strategies and interpretations.

*[Grid<>Matrix]*, located in the Special Exhibitions Gallery, investigates both ruptures and continuities between these two distinct yet related modes of visual organization, exploring how the grid and the matrix have influenced people's understanding of aesthetics, art and media since the early 20th century.

Drawn from private collections and major museums, *[Grid<>Matrix]* is curated by Eckmann and Lutz Koepnick, Ph.D., professor of German and of film and media studies, both in Arts & Sciences. It features work by 15 artists from Piet Mondrian and Laszlo Moholy-Nagy to major important contemporary figures such as Albert Oehlen, Julius Popp and Jeffrey Shaw.

*Models and Prototypes*, also in the Special Exhibitions Gallery, investigates the growing importance of the model as a visual strategy since the early 20th century. As Western art has moved away from straightforward depictions of the natural universe, models and prototypes have evolved from preparatory steps in the creative process to become increasingly autonomous works of art, redefining artistic practice.

Drawn predominantly from the permanent collection, *Models and Prototypes* is curated by Catharina Manchanda, Ph.D., who joined the Kemper Art Museum last spring. Artists range from Marcel Duchamp and Wassily Kandinsky to Daniel Buren, Isa Genzken, Jenny Holzer and Joseph Kosuth.

*Pure Invention: Tom Friedman*, in the College of Art Gallery, features more than 30 works by the St. Louis native, who earned a bachelor's degree in graphic illustration from WUSTL in 1988.

Curated by Michael Byron, associate dean of faculty and professor of painting in the College of Art, it surveys the last decade of Friedman's career.

*Pressing Issues*, in the museum's Teaching Gallery, is curated by Lisa Bulawsky, associate professor of printmaking in the College of Art, and Elizabeth Childs, Ph.D., associate professor of art history & archaeology in Arts & Sciences.

For more information, go online to [kemperartmuseum.wustl.edu](http://kemperartmuseum.wustl.edu).

## Complex

Programs now located in one central site

— from Page 1

ington University by drawing together our distinguished art, architecture and museum programs," Chancellor Mark S. Wrighton said. "It fosters a collaborative, interdisciplinary environment in which students and faculty can strive for excellence and distinction."

Carmon Colangelo, dean of the Sam Fox School and E. Desmond Lee Professor for Community Collaboration, adds that "Maki's intimate relationship with Washington University makes him the ideal architect for the Sam Fox School. His designs are thoughtful, innovative and inspirational. In many ways, they exemplify our own aspirations and our vision for the future of design and the visual arts."

Costs for the new construction and renovations have been met through the allocation of University funds and the receipt of outside commitments.

These include \$10 million in gifts and bequests from St. Louis philanthropist Sam Fox, the founder, chairman and chief executive officer of Harbour Group Ltd., and a \$5 million gift from the family of the late Mildred Lane Kemper — \$1 million from her husband, James M. Kemper Jr., chairman emeritus of Commerce Bancshares Inc.; \$1 million from their son, David W. Kemper, chairman, president and CEO of Commerce Bancshares as well as chairman of WUSTL's Board of Trustees, and his wife, Dotty Kemper; and \$3 million from the William T. Kemper Foundation.

Other leadership commitments include a major gift from Earl E. and Myrtle E. Walker, CEO and vice president, respectively, of Carr Lane Manufacturing Co., as well as gifts from Eric P. and Evelyn Newman; the Gertrude and William A. Bernoudy Foundation; Kenneth and Nancy Kranzberg; Linda and Harvey Saligman; Fred Kemp; the children of Florence Steinberg and Richard K. Weil; May Department Stores Co.; the Caleb C. and Julia W. Dula Educational and Charitable Foundation; the Mary Ranken Jordan and Ettie A. Jordan Charitable Foundation; and Yvette Drury and John P. Dubinsky. Challenge grants were awarded by the J.E. and L.E. Mabee Foundation and The Kresge

Foundation.

Maki, who serves as design architect, selected Harish Shah — a principal of Shah Kawasaki Architects, based in Oakland, Calif., and a 1973 WUSTL graduate — to serve as project architect. St. Louis-based McCarthy Building Cos. Inc. is construction manager.

### Kemper Art Museum

The 65,000-square-foot, limestone-clad Kemper Art Museum more than triples the exhibition space previously available in Steinberg Hall.

On the main floor, the central, barrel-vaulted Saligman Family Atrium is flanked on either end by open, curtain-wall glass entrances. Soaring 25-foot ceilings, generous skylights and banks of clerestory windows define the Special Exhibitions Gallery and the College of Art Gallery, both located just off the atrium.

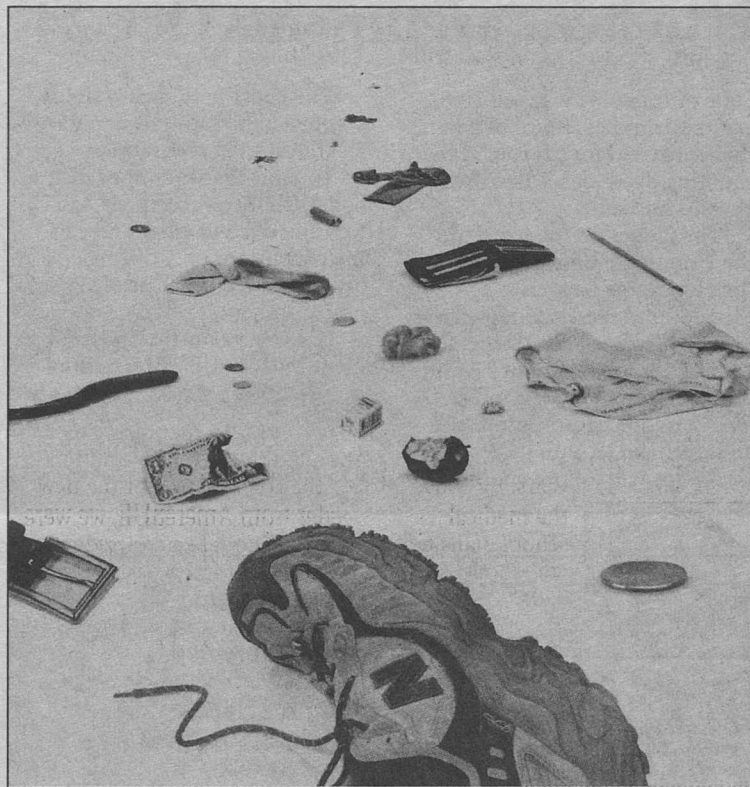
The floating limestone Freund Family Grand Staircase brings visitors up to the luminous Bernoudy Permanent Collection Gallery, also distinguished by large, recessed skylights.

"Maki's interiors are informed by a modernist sensibility, which he realizes through a proportional application of grids and geometric forms," said Sabine Eckmann, Ph.D., director and chief curator of the Kemper Art Museum. "The formal effect is softened by an integrated use of natural light that creates a spacious but intimate atmosphere and allows for relations between inside and outside."

The elevated 5,000-square-foot Florence Steinberg Weil Sculpture Garden extends the museum's exhibition space outdoors from the May Department Stores Foyer on the building's north side. Alongside works from the collection — including Alexander Calder's signature *Five Rudders* (1964) — the sculpture garden features a site-specific installation commissioned from Dan Peterman. The Chicago artist employs a post-minimalist aesthetic to create functional objects made of post-consumer materials.

Other recent acquisitions — purchased specifically for the new building — are installed in the atrium. These include a monumental canvas, *MM6* (2001), by Michel Majerus and Olafur Eliasson's spectacular *Your Imploded View* (2001), a highly polished, 600-pound aluminum sphere that swings like a pendulum from the atrium's vaulted ceiling.

"Both works deliberately negotiate the impact of new technology on the production and perception of art," Eckmann noted.



*Vanishing Point* (2006), from the exhibition *Pure Invention: Tom Friedman*, was created in collaboration with Island Press, the Sam Fox School's professional print shop. Image courtesy of the artist, Island Press and Gagosian Gallery.

"While Majerus combines the aesthetics of electronic art with the medium of painting in the 21st century, Eliasson's installation, through its reflective and distorting qualities, implicates viewers in both the art and the surrounding architecture. It shows us caught in the act of seeing ourselves see."

In addition to galleries, the Kemper Art Museum will include:

- Newman Money Museum (see related story, above.)
- The 12,000-square-foot Kenneth and Nancy Kranzberg Art & Architecture Library, housing books, a slide library and other research materials for art, architecture and art history.
- Offices and classrooms for the Department of Art History & Archaeology in Arts & Sciences.
- The Whitaker Learning Lab, a new-media center.
- The Lehmann Museum Classroom.
- The Kemp Reading Room.
- The Lopata Art History Classroom.

### Walker Hall

Walker Hall, located immediately east of the Kemper Art Museum, contains approximately 38,000 square feet of art studio space as well as the Shapleigh Courtyard and Terrace, enclosed along the north side, for materials and fabrication.

Like the Kemper Art Museum, Walker Hall is defined by its open, flexible floor plan and

abundant natural light. Ceramics, woodworking and metalworking facilities are located on the main floor, with undergraduate sculpture studios on the lower level. The upper level features undergraduate painting as well as the interdisciplinary Nancy Spirtas Kranzberg Studio for the Illustrated Book.

All studios showcase state-of-the-art systems for art production as well as fluid floor plans designed to facilitate collaborative study and discussion.

### 'Sense of community'

Jeff Pike, dean of Art, points out that Walker Hall, along with recent renovations to Bixby and Givens halls, has allowed programs previously housed at satellite facilities to return to the Danforth Campus for the first time in decades. This, he explains, already has led to a renewed sense of community within the College of Art while also fostering greater interaction among other units of the Sam Fox School.

"The opening of Walker Hall and the Kemper Art Museum will transform the experience of students and faculty in art and architecture," Pike said. "For the first time in decades, all of the University's undergraduate design and visual arts programs will be located in a single, central location."

"This is truly a moment for celebration."



## Notables

### Engineers Without Borders hosts regional conference

By TONY FITZPATRICK

The local chapter of Engineers Without Borders (EWB) will host the Engineers Without Borders Midwest Regional Workshop Oct. 20-22 at the School of Engineering and Applied Science. Schools from all over the Midwest will be represented.

The event kicks off Oct. 20, with a check-in and a mixer dance. The meetings will take place the following two days, and about 100-120 Washington University EWB faculty and students are expected to attend. It is the engineering school's contribution to this year's Danforth Campus theme of "A Higher Sense of Purpose."

EWB member Will Fischer said the University's EWB group was formed just 11 months ago. He added that the Midwest chapter of EWB may have selected

WUSTL as a host site because of a recent service project in El Salvador.

From May 20-30, a group of EWB members traveled to El Salvador to survey and collect information regarding the feasibility of constructing a water pump system to move water up a mountain to supply a village with running water.

The survey was a success, and as soon as more funds are allocated or found for the project — and the project is approved — a date will be set to go back to El Salvador and construct the pump system.

Pictures are available at: <http://flickr.com/photos/ewbwashu/sets/72157594206927395/>.

For more information on the University's EWB chapter, go online to <http://userfs.ccc.wustl.edu/~ewbwashu/>.



**Scholars Academy** Missouri Sen. Rita Heard Days offers an inside look at American politics as part of an Oct. 11 forum for students participating in the University's McDonnell International Scholars Academy. The forum, hosted by the Richard A. Gephardt Institute for Public Service, focused on "International Issues Reflected in the Upcoming U.S. Elections: Local, State and Federal Perspectives." Other panelists, from left, are Andy Sobel, Ph.D., associate professor of political science in Arts & Sciences; Richard A. Gephardt, former U.S. congressman (D-Mo.) and chair of the institute's advisory committee; and Murray Weidenbaum, Ph.D., former chief economic adviser to President Reagan and the Mallinckrodt Distinguished University Professor at WUSTL. Launched this semester, the McDonnell Academy's inaugural class comprises 17 scholars from 12 of Asia's leading universities.

## Energy

— from Page 1

"Both the Danforth and Medical campuses burned coal, and without the proper equipment to eliminate the emissions, we were faced with having to shut down or spend millions of dollars to become more environmentally friendly," Thaman said.

### Millions in savings

Since 1992, the School of Medicine has saved \$26 million as a result of various equipment upgrades and other energy-saving measures.

"According to Walt Davis, assistant vice chancellor and assistant dean of facilities at the School of Medicine, the medical campus Department of Facilities Management has been replacing and upgrading old systems to improve efficiency and reliability, cut costs and reduce energy use.

Among the many changes were replacing inefficient boilers, chillers and other production equipment with more efficient and reliable models; and updating heating, ventilating and air-conditioning systems in several buildings.

The School of Medicine also updated technology with automated lighting systems, variable speed systems that deliver the right amount of energy when it's needed and an automated campus-wide chilled water system that optimizes about 18,000 tons of cooling capacity. Compare that to a typical home, which has about 2 tons to 4 tons of cooling capacity.

"Ralph, Walt and their staffs have been working diligently to make Washington University's buildings energy efficient," said Bruce Backus, assistant vice chancellor for environmental health and safety. "The facilities departments' efforts dovetail very nicely with the University's new environmental and energy initiatives."

Pratim Biswas, Ph.D., the Stifel and Quinette Jens Professor of Environmental Engineering Science and chair of the newly created Department of Energy, Environmental and Chemical Engineering, and John Klein, executive vice chancellor for administration, are leading these initiatives.

"Pratim and John, with Ralph and Walt, are working together to integrate environmental research and teaching into university operations," Backus said, "with the hopes that the University will become a leader in energy efficiency

and that University operations will provide faculty and staff with environmental research and teaching opportunities."

Another challenge facing both campuses is keeping up with the significant building growth seen since 1990. The Danforth Campus has seen the square footage of building space grow by 53 percent, with anticipated future growth expanding at approximately another 22 percent.

Square footage of new and renovated buildings on the medical campus has increased by more than 50 percent over 15

years. By 2009, the medical school plans to add another 350,000 square feet of building space, Davis said.



Thaman

In the past few years, efforts to increase energy efficiency

have kept electricity use relatively flat, while square footage has grown by more than 12 percent.

### Revamped fume hoods

Laboratory fume hoods and air-handling systems consume significant energy on both the Danforth and medical campuses.

Because of the chemicals and materials used in research labs, air cannot be re-circulated throughout the buildings as it could in a home — air is heated or cooled once, then it is exhausted out, and that costs a lot.

On the Danforth Campus, facility engineers have worked with a manufacturer to develop a fume hood that controls the chemicals and gases while using a significantly lower volume of air, thus saving energy costs.

Growth in facilities presents major challenges, as well as a need to develop solutions and new goals, including energy conservation and reducing operating cost; air conditioning all buildings; shutting down the central steam plant in the summer; replacing a single high-pressure steam plant with distributed low-pressure plants located near loads; installing computer-based campus energy management systems; increasing electrical capacity and improving reliability; and designing for maximum flexibility and future growth.

### Reliability improves

"Fifteen years ago, the Danforth Campus had two electrical feeds from AmerenUE, but they were on the same poles coming from

the same substation," Thaman said. "If one pole was hit, the entire campus went down."

"Also, we did not have any automatic switching from one feed to the other, so personnel had to be called in to make the switch. We were able to have AmerenUE install a third electrical feeder from a different substation, and we installed automatic switching equipment so following any interruption from AmerenUE, the feed would switch automatically."

Thaman continued: "Although the University had to pay for the construction of the new feeder from AmerenUE, we were able to negotiate a cost reduction by allowing MetroLink to use the feeder as well."

### Replacing coal

As part of its efforts, the Danforth Campus has succeeded in shutting down the boiler plant in the summer and replacing coal with natural gas, using oil as a back-up fuel. Additionally, the steam distribution system has been upgraded, and boilers have been installed on the South 40.

According to Davis, the medical campus has a big focus on the reliability of the electrical, steam and chilled water systems because of the research labs and patient-care facilities. In support of that effort, the medical school and Barnes-Jewish and St. Louis Children's hospitals back each other up in case of emergency.

His department installed new fume hoods in the Clinical Sciences Research Building that switch automatically to low flow when no one is in the area. The move from the previous fume hoods, which ran 24 hours a day, saves about \$400,000 a year, said Jim Stueber, director, facilities engineering. That work caught the attention of the St. Louis chapter of the American Society of Heating, Refrigerating and Air Conditioning Engineers Inc., which awarded the project its technology award.

Now, a Danforth Campus energy management system has been implemented.

### Natural gas costs

One of the big issues facing the University is the large increase in the cost of natural gas.

In FY 2002, natural gas usage on the Danforth Campus cost \$1,270,821. In FY 2006, the cost was \$4,100,299. Meanwhile, electricity costs have risen marginally, from \$4,197,475 in FY 2002 to \$4,386,394 in FY 2006.

At the School of Medicine, the total electricity cost dropped

11 percent between 2002-06 from \$7.4 million to \$6.6 million, while natural gas costs increased 219 percent from about \$2.1 million to \$6.7 million.

The Danforth Campus implemented the following energy and cost-control strategies: minimizing the energy usage to maximum extent; pursuing justifiable energy conservation projects; utilizing financial instruments for purchasing energy; and keeping manpower at minimum levels.

### Researchers abound

"In addition to energy savings in University Facilities and Operations, several academic researchers are active in research related to energy and the environment," Biswas said. "In fact, Chancellor Wrighton appointed an 18-person working group to prepare a report outlining a vision for WUSTL."

"One recommendation was for the facilities units at the University to work closely with faculty, to ensure that energy issues were a part and parcel of the academic and research enterprise."

The group's report can be seen online at [eer.wustl.edu](http://eer.wustl.edu).

"Several faculty are also involved in cutting edge research — which may not be used in University operations today — but may some day in the future," Biswas said. "Projects under way include using nanotechnology for reducing emissions from fossil fuel combustion systems, energy conservation, waste-to-energy conversion, solar technologies, photosplitting of water for hydrogen production and bioenergy technologies."

"Graduate and undergraduate students are involved in educational and research activities. A notable project was the one led by students in the Committee on Environmental Quality — where a set of solar panels were installed on the roof of Olin Library that tie into the grid. And a new department has been created in the School of Engineering and Applied Science — the Department of Energy, Environmental and Chemical Engineering — to further enhance WUSTL's involvement in this area of education and research."

"Overall, this is an exciting time at the University, as faculty are teaming up to address prob-

lems of great relevance to the world."

To view the real-time power generated by the solar panels on the roof of Olin Library, go online to <http://view2.fatspaniel.net/FST/Portal/CromwellEnvironmental/OlinLibrary/EndUserView.html>.

But Olin Library is hardly the sole beneficiary of environmental quality measures. According to Thaman, efforts throughout the entire University are being undertaken with environmentally friendly energy reduction goals in mind.

"We are a participant in the U.S. Green Lights program, and have replaced all fluorescent tube bulbs with T8 lamps and all ballast with electronic units," Thaman said. "And we are trying to minimize the use of outside air. Anytime outside air is brought into a building, it has to be either heated or cooled. By reducing the amount of outside air brought into a building, there is a reduction in the use of energy."

"We have installed CO<sub>2</sub> detectors in large lecture halls and meeting rooms, so by detecting the amount of CO<sub>2</sub> in the room, we minimize the amount of outside air needed. CO<sub>2</sub> is created by the occupants in the room, so fewer people means less outside air required."

### From the beginning

While several strategies can be used internally, some are in place before a building ever gets beyond the blueprint stage.

"By standardizing design, we have reduced the use of energy in the design of new and renovated space," Thaman said.

However, there will always be challenges associated with controlling energy costs and being more efficient. Some of these include increasing capacity demands as the University grows, increasing reliability demands, an aging infrastructure, rising utility costs, stricter environmental compliance and limited manpower.

Still, the University is doing well when compared with similar institutions.

"When you compare the Danforth Campus to other peer institutions in the Midwest region as determined by the Central Association of Physical Plant Administrators, our overall energy usage is lower," Thaman said.

"Our efforts to enhance University operations is continuous and we look to find new ways to improve the efficiency of energy utilization," Wrighton said. "Our goal is to keep getting better year after year."



Davis



## Washington People

**K**elle Moley, M.D., professor of obstetrics and gynecology, learned many of the research methods she uses today from Oliver H. Lowry, M.D., Ph.D. a famous biochemist — and a memorable 82-year-old mentor.

During Moley's internship in obstetrics and gynecology at the School of Medicine in 1988, Alan L. Schwartz, Ph.D., M.D., head of the Department of Pediatrics, introduced Moley to Lowry after he heard of her interest in reproductive endocrinology.

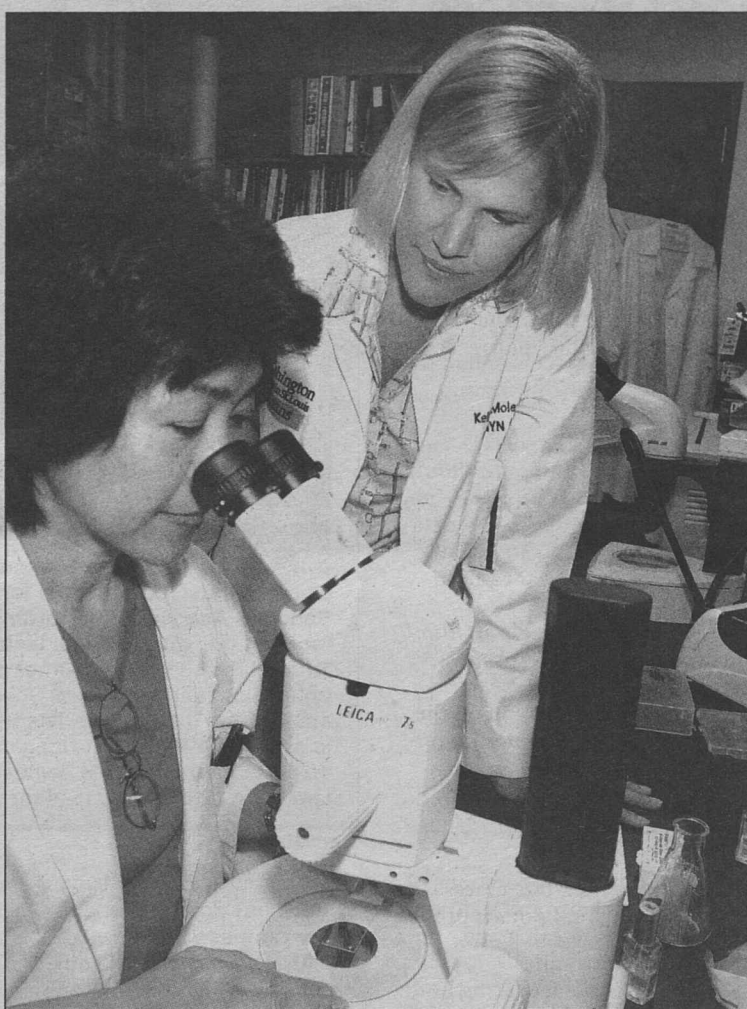
"Dr. Schwartz walked me right over to Dr. Lowry's lab, and Dr. Lowry said I could work in his lab anytime," Moley says.

During her postdoctoral fellowship in Lowry's laboratory, Lowry taught Moley how to measure enzymatic reactions using nano-sized droplets of solution under oil to avoid evaporation.

These techniques of biochemical analysis enable researchers to measure the concentration of substances such as glucose in a single mouse embryo or in single cells. Moley receives calls each month from researchers who want to use these techniques in their projects.

"Dr. Lowry was incredibly brilliant, very humble and blatantly honest," Moley says.

Moley is one of a handful of



Kelle Moley in her lab with technician Maggie Chi (left). "I think getting people more interested in reproductive biology as a scientific career combined with a medical career is very much needed in this country," Moley says. "If I can train more young women and men to go into science and be physician-scientists in this field, I think that would be a huge success for me."

BY DIANE DUKE WILLIAMS

## Breaking ground in reproductive medicine

**Kelle Moley seeks the link between blood sugar levels and higher rates of miscarriage**

people in the world studying the effects of maternal type 1 and type 2 diabetes on the implantation and development of mice embryos. In 1999, she found that short-term exposure to high concentrations of glucose or insulin during the first 72 hours after fertilization is enough to alter the embryos and could help explain the higher rates of miscarriage and malformed babies among diabetic women.

Her research suggests that diabetic women who are trying to get pregnant should be very careful about controlling their blood sugar levels.

The research methods Moley learned from Lowry have helped her become one of the international stars in reproductive biology.

"Her work on carbohydrate metabolism in the embryo has been groundbreaking, and she is recognized nationally and internationally as the expert in this area," says George A. Macones, M.D., the Mitchell and Elaine Yanow Professor and head of the Department of Obstetrics and

Gynecology. "In addition to her tremendous talent as an investigator, Dr. Moley is a caring clinician, wonderful mentor and fine citizen of the University."

In 1998, Moley started her own laboratory, where she now spends 80 percent of her time. Maggie Chi, a technician who had worked in Lowry's lab for 25 years when Moley joined the lab, works with her.

"I couldn't have done all this without Maggie," says Moley, also an associate professor of cell biology and physiology.

Moley also is known for cloning and characterizing two novel glucose transporters, GLUT8 and GLUT9, the latter of which she discovered in collaboration with her husband, Jeffrey Moley, M.D., professor of surgery. Her work on these proteins demonstrated that they changed location in response to insulin and that diabetes altered their expression.

Her research has significantly increased the understanding of molecular reproduction and glucose metabolism in diabetic ani-

mals and has shown how this research could be applied to humans with diabetes.

Moley also is director of the Fellowship Program in Reproductive Endocrinology and the Clinical Mentorship Program for the University's Markey Pathway, a graduate program that provides students with a deeper understanding of disease.

Moley says her greatest love is mentoring young people to go into science.

"I think that's my mission, coupled with patient care," Moley says. "We have so many people now coming into medicine who want to try to figure out how to do research and patient care. I just give them examples of what I do."

Moley has mentored more than 30 people, ranging in experience from high-school level to clinical fellows and postdoctoral research fellows. Most have gone on to medical school, graduate school or academic research careers.

Philip Stahl, Ph.D., the Edward Mallinckrodt Jr. Professor and head of the Department of Cell Biology and Physiology, who has known Moley for 15 years, calls her an outstanding mentor. "She has empathy, concern, hope, enthusiasm and standards — all the things that make a great mentor," he says.

As a child, Moley always liked science and spent time in her father's lab at Pfizer Inc. in Groton, Conn. But her father, who developed drugs in his laboratory, told Kelle she should go to medical school because he thought it would be a more fulfilling field.

Ironically, her father went on to lead the team of five scientists at Pfizer who developed Zoloft, the popular anti-depressant drug.

"He has affected many more lives than I ever will," Moley says.

At Wellesley College in Massachusetts, Moley majored in biochemistry and already knew she wanted a career in academic medicine. After medical school at Yale University, she chose a residency in obstetrics and gynecology at

WUSTL and decided to focus on reproductive endocrinology because she planned to conduct mouse embryo research.

"This was about the time that in vitro fertilization was becoming very big, and the field seemed wide open as far as research," says Moley, who also is vice chair for basic science research and director of the Division of Basic Science Research in the Department of Obstetrics and Gynecology.

Over the years, Moley's research has evolved into studying the developmental origins of adult disease — the idea that if something happens to an egg in vivo it can cause diseases the person has in the future, such as hypertension or type 2 diabetes.

Historically, obstetrics and gynecology hasn't been a leading research field, Moley says, and she's hoping to change that.

"I think getting people more interested in reproductive biology as a scientific career combined with a medical career is very much needed in this country," she says. "If I can train more young women and men to go into science and be physician-scientists in this field, I think that would be a huge success for me."

Clinically, Moley sees women who are interested in having in vitro fertilization and prepares them for the procedure, testing their blood for hormone levels and prescribing medication to stimulate ovulation.

If a woman becomes pregnant, she follows her until she's ready to be referred to an obstetrician. She also treats women who have polycystic ovary disease, a hormonal condition that prevents many women from becoming pregnant.

Moley and her husband, Jeff, have three boys: ages 14, 13 and 9. She spends much of her free time at their baseball, soccer and hockey games, and she also plays flute and piano when the family plays music together.

Jeff performs with a bluegrass band called Seldom Home, and the family enjoys St. Louis sports events, playing golf and relaxing at their lakeside A-frame at Innsbrook Resort. They also spend a lot of time traveling to Colorado and New York to visit relatives, and Kelle Moley's father takes the family to Hawaii every other year.

Schwartz, the Harriet B. Spoehrer Professor of Pediatrics, sums up Moley's contributions in this way.

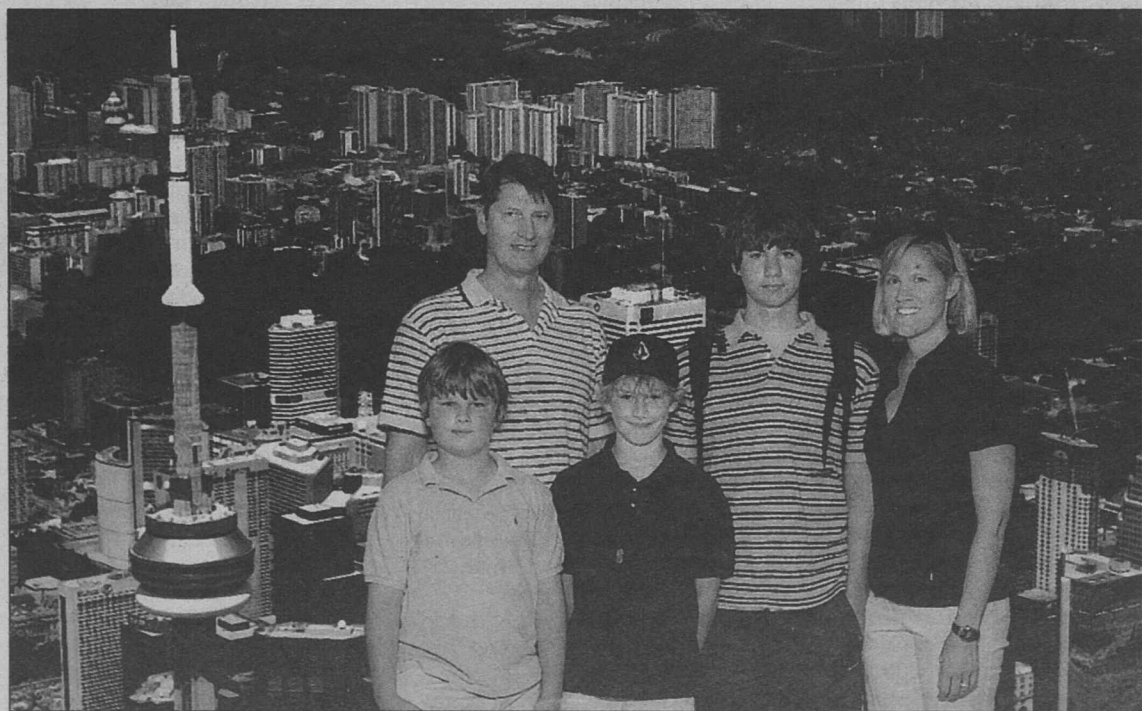
"She is a local, national and international leader in reproductive biology — as a scientist, as a clinician and as an educator," he says. "As a resident, she described how diabetes increases the risk of birth defects and complications in the babies of women who have this disease before they become pregnant, and she has pursued this research with laser focus and creative insight. We are thrilled that she is our colleague."

### Kelle Moley

**University position:** Professor of obstetrics and gynecology and of cell biology and physiology; vice chair for basic science research and director of the Division of Basic Science Research in Obstetrics and Gynecology

**Years at University:** 14

**Hobbies:** playing flute and piano, playing in the handbell choir at Grace Episcopal Church in Kirkwood, running, knitting



The Moley family on a spring vacation. (From left) John (9), Jeffrey Moley, M.D., Charlie (13), Patrick (14) and Kelle Moley, M.D.