



Interactive Architecture

New research facility is designed to get scientists talking.

Water-cooler conversations rarely do more than spread office gossip in a typical workplace. But for scientists, impromptu interactions spark ideas, shed light on problems, and cultivate research alliances.

That's the thinking behind the design of the Wisconsin Institutes for Discovery, a state-of-the-art UW research facility under construction on the 1300 block of University Avenue. In details large and small, the 300,000-square-foot building promotes interdisciplinary collaboration, allowing researchers to break down the barriers between fields and tackle science's most complex and important problems together.

The UW has a long tradition of interdisciplinary research,

height — just four floors aboveground — increases the chances that people will walk around and bump into each other.

"There has been a very conscious architectural strategy to create spaces that people will want to be in," says **George Austin '74, MA'76, MS'76**, who is manager of the building project. "We want to draw people out of their offices and give them a chance to connect with one another in formal and informal ways."

Funded by the state, the Wisconsin Alumni Research Foundation, and alumni **John '55** and **Tashia '55 Morgridge**, the building will house two institutes: a university center known as the Wisconsin Institute for Discovery and a private,

Accomplishing those goals will be the first order of business. But the planning team also wants the institutes to be a "relationship incubator," where groups of scientists, business people, educators, scholars in the humanities, and the public forge connections they wouldn't otherwise make, says **Gwen Drury**, who is developing the facility's social interaction space as part of her doctoral studies in the School of Education.

"We're trying to create a space where research groups can build strong ties internally and build bridges to the community," she says.

The ground floor will house a bustling public space known as the town center. In addition to meeting places for workshops, lectures, and outreach events, it will include a winter garden, restaurant, and soda fountain — the last to commemorate the historic Rennebohm building and pharmacy that used to stand on the block.

Another key element is a café. "When we talked with people around campus about what should be part of this facility, we heard, 'Coffee. Good coffee,'" Austin says with a laugh.

One big question about the building remains: Who will work inside? With one notable exception — the recent appointment of stem-cell researcher **James Thomson** as one of the Morgridge Institute's scientific directors — that has yet to be answered. But this hasn't stopped hundreds of UW faculty and staff from offering their ideas for the new space.

"This is not happening idly, I can guarantee you that," says Austin. "The design process has been very integrated and involved many people. I think that speaks to the hopes and dreams for this building."

— Madeline Fisher PhD'98



COURTESY WISCONSIN INSTITUTES OF DISCOVERY

The Wisconsin Institutes for Discovery facility is designed to encourage informal meetings. It includes atria such as this and "communicating" stairs (background) where people can stop and chat.

yet only recently have buildings begun to rise around the concept. In this facility, floors will be linked by "communicating" stairs that invite scientists to stop and talk. Labs will be arranged in neighborhoods surrounded by open, sun-drenched space, rather than along stark, linear corridors. Even the building's

nonprofit medical research organization called the Morgridge Institute for Research. When the doors open in 2010, officials hope the facility will help the university compete for the most talented faculty, as well as produce new technologies, treatments for disease, and economic development.

Disarming a Deadly Virus

UW researchers subtract a gene, encourage study of Ebola.

In the gallery of dangerous pathogens, Ebola is king. With no effective treatments and a mortality rate between 50 and 90 percent, few agents are more lethal. That deadly quality inspires biomedical research, of course, but has also provided grist for Cold War weaponeers and seeded popular culture with a convenient microbial villain.

So far, the Ebola virus has emerged in lethal outbreaks only in remote parts of Africa. It is classified by the U.S. Centers for Disease Control as a Bio-safety Level 4 (BSL 4) agent, a designation that confines Ebola research to a handful of highly specialized labs. But because such lab space is exceedingly rare, that categorization has hampered scientists' ability to conduct research and develop countermeasures.

Now, however, in a molecular gambit, a group led by UW-Madison virologist **Yoshihiro Kawaoka** has disarmed Ebola, making it safe to study in an ordinary biology lab. By removing a gene that makes a protein the virus needs to replicate,

Kawaoka's team has rendered Ebola impotent, leaving it unable to infect all but a specialized type of cell engineered to make the protein it requires.

"We wanted to make biologically contained Ebola virus," explains Kawaoka, a professor of pathobiological sciences in the School of Veterinary Medicine. The idea, he says, is to have a system where Ebola can be studied safely without the constraints of the highest-level biosafety lab. Such space is scarce; members of Kawaoka's group must travel to Winnipeg, Manitoba, for access to a BSL 4-level lab. Because such labs are costly, they are typically small, without room for the kind of equipment necessary for drug screening. The new Wisconsin work promises to help resolve the issue.

An unaltered Ebola virus is capable of infecting any cell in the body with the exception of the immune system's T cells. "This altered virus does not grow in any normal cells," says Kawaoka, explaining that his group excised VP30, a gene that

makes a protein the virus needs to make copies of its genome. Kawaoka's team next engineered monkey kidney cells to produce the missing protein, creating a new system in which the virus can be studied.

"The virus can grow in this [engineered] cell — but only in this cell, because the missing protein is provided," he says. In every other respect, the neutered virus is the same as the deadly versions that have killed more than a thousand people since 1976.

"This system can be used for drug screening and vaccine production," he says, noting that the technology could bring the virus into play in many more than the handful of labs that currently have the necessary biosafety infrastructure. Such access, Kawaoka argues, is our best hope to thwart this



SPENCER WALTERS

Stem-Cell Patents Endure Legal Challenge

That loud cheer coming from the western edge of campus this spring? That was the legal team at the Wisconsin Alumni Research Foundation (WARF) rejoicing as the U.S. Patent and Trademark Office affirmed UW-Madison's role in the breakthrough discovery of human embryonic stem cells.

In two detailed rulings, the patent office upheld three patents on the cells held by WARF, the private, nonprofit patenting and licensing organization for the UW. The patents cover the early discoveries made by UW stem-cell pioneer **James Thomson**, the first scientist to isolate and culture human embryonic stem cells.

Nonprofit groups based in New York and California challenged the patents in 2006. Yet, says **Carl Gulbrandsen PhD'78, JD'81**, WARF's managing director, "WARF always believed Dr. Thomson's breakthroughs were patentable inventions and seized the opportunity to put to rest the erroneous suggestion that what he did was obvious and that

anyone trained in the art could have done it."

WARF officials believe the drive to knock down the patents was rooted in the political and financial motivations of key opponents, not the righting of a patent wrong. Whatever the motivation, the patent office's thorough re-examination rejected the challengers' arguments — rendering the patents even stronger than before, officials say.

One of WARF's aims, they say, is supporting and expanding stem-cell research. Its affiliate WiCell Research Institute has provided more than nine hundred free academic licenses for stem cells, which have been shipped to more than 563 researchers in twenty-five countries and forty states. WARF also has finalized thirty commercial licensing agreements with industry partners who are hoping to bring stem-cell therapies and tools to market. WARF will use fees from these commercial licenses to support UW-Madison research.

— Staff

The Substance of Satire

Does comedy make people curious about more serious stuff?

The Daily Show on TV's Comedy Central might be good for more than laughs. **Michael Xenos**, a communication arts assistant



professor, suspects it may push people to learn more about the issues that affect their lives. He's taking the show into the lab to test that theory.

"One of the things I'm dying to figure out with the new study is: does comedy get people talking?" Xenos says.

He is looking at two groups of college-age viewers: one that watches the comedic program

and a real news source and a second that gets strictly hard news. Xenos expects viewers who are not well versed in politics will pick up information from *Daily Show* host Jon Stewart and his team of comic correspondents and then learn more from traditional media.

"Because it's laced with comedy, it's a little sugar that's put in with the story that gets people to be more attentive," Xenos says.

He shows students clips from either *The Daily Show* or a network news broadcast centering on one of two subjects: the economy or Roger Clemens's testimony about baseball doping. Students then watch a sample from PBS's *NewsHour with Jim Lehrer*, including stories on unrelated issues, before answering a series of questions.

"There's kind of a distinction between awareness and actual knowledge," Xenos says. "Jon Stewart's pretty good, but he's not including a lot of detailed information. ... That's what's leading a lot of people to say, 'They can't possibly be learning all this stuff from Jon Stewart.'"

Xenos says his research is inspired by the idea that non-traditional information sources, including comedy, may have a stronger effect on young people.

He's also studied whether college students seek information from other sources after watching the program. In earlier research, he showed students a *Daily Show* segment about congressional debate over the troop surge in Iraq. He compared that group with others who either watched no clips, just hard news, or parts of both real and the fake news programs.

"It was really terrific, because both of the segments used a lot of the same footage, the same quotations," Xenos says. "They're covering the same event, but in different terms."

The second step was to show students a simulated news Web site. Among those who watched the comedy clip, viewers interested in politics searched for more information about the troop surge; those who said they weren't interested did not search as much.

— Jenny Price '96

APPALACHIAN STATE **Lining Up Votes**

Tucked into a corner of Laundry 101 on West Gilman Street and gathered at tables in Starbucks on State Street, students have been brainstorming ways to mobilize their generation to participate in the presidential campaign.

UW-Madison's student organizations supporting Hillary Clinton, John McCain, and Barack Obama have been providing information, generating enthusiasm for their candidates, and — most importantly — getting their fellow students to the polling places.

"It's really nice to have someone your age who knows what you're going through and will say, 'Hey, this is what this candidate is all about,' and open people's eyes that people do care about our age group," says **Allison Nelson**, co-chair of Students for McCain.

Students also have held fund raisers, handed out signs and buttons, and helped with campaign

visits. During spring semester, former President Bill Clinton, Chelsea Clinton, and Obama made stops on campus, drawing potential voters to the Stock Pavilion, Memorial Union, and the Kohl Center, respectively. **Meg Brown**, a member of Students for Hillary, says the group worked to increase visibility for the Clinton family visits.

"When the [Obama] campaign came through, we were working with elected officials and campaign members," says **Ami ElShareif**, chair of Students for Obama. "Now we know how a campaign is run in the field."

The student organizations could see the results of their hard work when the Wisconsin primary arrived on a frigid February day. Campus wards drew a 65 percent voter turnout, setting records at some wards and totaling six thousand more voters than in 2004.

— Vanessa de Bruijn '08



Greek Beat

Neighborhood watch brings security to Langdon Street.

A late-night stroll east of campus is now safer, thanks to some vigilant UW students. The brainchild of Madison Police Sergeant Tony Fiore, the Langdon Street Neighborhood Watch program was launched in fall 2006 after a rash of robberies and assaults hit the street that's home to many sororities and fraternities.

Safety is a perennial issue in the campus area, where the high rate of turnover among residents means that people seldom know their neighbors. This year's violent crimes included murder. Student **Brittany Sue Zimmermann x'09** was found dead in her apartment south of campus, in a neighborhood not covered by the watch Fiore led, and as of press time, police had not arrested a suspect.

Such dangers leave students feeling uneasy, making cooperative efforts between them and city police, such as the Langdon Street watch, vital for the community.

On Fridays and Saturdays from 11:00 p.m. to 3:00 a.m., volunteers from the Greek community patrol the area, armed with flashlights and cell phones and wearing reflective safety vests. They walk in groups and are instructed to be visible and be good witnesses without confrontation.

So far, those on the watch have found wallets, changed a flat tire, and called 911 when they discovered an unconscious woman, and they have good reason to believe they've prevented fights and property damage.

What's more, they've become more aware of their personal safety and have embraced the community service project with pride. On-duty patrols frequently receive thanks from fellow students,

and the program has earned community praise.

"Most students move on an annual basis and connect more to the UW than to their neighborhood," Fiore says. "Sororities and fraternities have a unique sense of ownership because their house and organization will always be there."

Despite this connection, Fiore found the students a bit resistant at first. "Being responsible for your own safety is a learning process and a new responsibility for many students," he says.

Greek leaders, including **Alex Sheridan '08** of Alpha Epsilon Pi and **Drew Willert '08**

of the Interfraternity Council, met with Fiore to develop the program and get buy-in from students. "It's an opportunity for them to get to know the MPD and deter crime," Fiore says.

Sheridan, Willert, and several other student coordinators who managed the program until their graduation this spring, are confident that it will continue.

The students honored Fiore at a reception in February, when he was promoted and passed the baton to a new Langdon neighborhood officer, **Rene Gonzalez MS'93**.

— Karen Roach '82



TOM KRUPENKIN

Liquid beads on a surface composed of silicon nanonails.

COOL TOOL

Getting a Bead on Nanonails

Any driver struggling to see the road through a veil of squashed bugs can appreciate the concept of a self-cleaning windshield. That's what could be possible using nanonails, a material developed by UW scientists **Tom Krupenkin** and **J. Ashley Taylor** with colleagues from Bell Laboratories.

Nanonails — etched from a wafer of silicon and shaped like tiny carpenter's nails — make up a surface that repels virtually all liquids, including water, solvents, detergents, and oils. Liquids bead on the surface, "almost like sitting on a layer of air," Krupenkin says, because their molecules can't slip between the nanonails.

The material could be used on the exterior of houses, windows, and airplane wings, and the ability to control drag could revolutionize underwater propulsion. We can't see the nanostructures scientists create, because they're thousands of times smaller than a human hair, but discoveries such as nanonails bring the possibilities of this rapidly changing field a little closer to home.

— J.P.

Tragedy struck the UW Hospital and Clinics staff in May when a **Med Flight helicopter crashed**, killing its crew. Clinical assistant professor Darren Bean, nurse Mark Coyne, and pilot Steve Lipperer all died in the accident.

Two UW alumni received **Pulitzer Prizes** in April. David Umhoefer '83, a reporter for the *Milwaukee Journal Sentinel*, and Walt Bogdanich '75 of the *New York Times* both served as editors of *The Daily Cardinal* while on campus.

Wisconsin will be the epicenter of all things stem cell as the **World Stem Cell Summit** (worldstemcellsummit.com) convenes at Madison's Alliant Energy Center September 22–23, providing expert speakers and networking opportunities for researchers, patient advocates, and the business community. To coincide, "Lab on the Lake," a free public event about stem cells, will be held September 21 at the Pyle Center on campus.

In a marriage of art and science, engineering professor Vadim Shapiro is using **Michelangelo's famed statue** to test a "scan and solve" technique for discovering where and how stress fractures will occur. The scan and solve method uses three-dimensional scanned or sampled data to determine where points of structural weakness lie.

An overnight fire severely **damaged the Sigma Phi Epsilon** fraternity house in early May. No students were injured in the conflagration, though three firefighters suffered minor injuries. The house, which is located at 237 Langdon Street, had about two dozen residents, who were all displaced during finals week.

At the Controllers

School of Ed explores the potential of video games.

Shree Durga MS'07, PhDx'09 darts among the desktop computers, trying to get all twelve networked at once. The students, meanwhile, are restless.

"Dude, if he's going to be China, you're going to want to play India," says Josh Orton, an eighth grader at Madison's Toki Middle School. A few minutes later, he's bickering good-naturedly with two girls at the neighboring monitors. "Hey, it's not my fault I have an empire to raise," he says.

The students have come, as they have most Monday afternoons, to the Wisconsin Youth Company, an organization that provides after-school programs for the Madison Metropolitan School District. They're here to attend CivCamp — or, more specifically, to play Sid Meier's Civilization III, a computer game that

lets players simulate and control the development and expansion of history's greatest powers.

As it turns out, the upshot of these afternoon sessions extends well beyond the game. Before these students began attending CivCamp, they were getting Bs and Cs in geography and social studies. Now, many of them routinely score As.

To **Kurt Squire**, the UW assistant professor of education technology who founded CivCamp four years ago, this scenario echoes his own experiences as a youngster. It also demonstrates that playing computer and video games — an activity in which more than 72 percent of Americans now engage, according to market research firm NPD Group — has potential to transform the country's public education system.

Squire and his spouse, assistant professor **Constance Steinkuehler MS'00, PhD'05**, are key participants in the Games, Learning, and Society (GLS) group in the School of Education. Both GLS and the MacArthur Foundation grant that supports it were launched by James Gee, who left the UW last fall for a teaching position at Arizona State University. GLS has moved the discussion from whether video games have educational potential to what can be achieved with them.

"When we can show in an after-school program that kids are using something like Civilization III to [explore] college-level history and geography, then why is it that in schools, we say, 'Oh, if it's a game, you can't bring it to school?' " asks Squire. He is developing several educational games in partnership with the Academic Advanced Distributed Learning Co-Lab, an organization that brings together academia, government, and industry to explore learning technology. "That's part of what we're trying to address here," he says.

While Squire's CivCamp focuses on elementary and middle-school students, Steinkuehler is measuring the digital literacy skills gamers are using when they play and post comments in the forums of the mega-popular online role-playing game World of Warcraft. She's found that more than 86 percent of the posted comments use basic scientific reasoning — the same kind of thinking that students are asked to use in biology or physics classes.

"Do I think that sticking kids in World of Warcraft is going to get them to do science reasoning? No, I don't," says Steinkuehler. "Games are just like a textbook — it's good for some things, but it's not good



BRYCE RICHTER

Shree Durga works with a Madison student during a game of Civilization III as part of CivCamp. Researchers observe the behavior of the elementary and middle-school children to see how video games teach history, geography, and international diplomacy.



for everything. ... You need to structure activities around it, and if you focus kids on rich problems, they'll do it naturally."

The key, as Steinkuehler notes, is translating these educational phenomena from the virtual world to the classroom — and that's where the Halversons of the GLS group come in. **Rich Halverson**, an assistant professor in educational leadership and policy analysis, is examining the ways teachers and administrators might use games to aid social and organizational change in schools. For instance, video games — which are particularly good at tracking performance data — could be used as a leadership tool for teachers.

"What we're talking about is using video-game design to inform professional learning," he says.

Meanwhile, his spouse, **Erica Halverson**, an assistant professor of educational psychology, approaches games from a mass-media perspective, exploring how kids use films and games to create identities. She has applied for a five-year grant from the U.S. Department of Education to create an in-school game space that might teach students science and social studies literacy.

"Basically, we're looking to formalize the informal connections Kurt has made in

Serious Games Central

- Madison is home to several major game-development studios that work with graduates from the UW's games studies program: Raven Software, Human Head Studios, Big Rooster, and Filament Games.
- **John Carmack** and **John Romero**, developers of the popular PC game *Doom*, spent several chilly months in Madison before making it big.
- Several leading academics in the field of gaming studied at UW-Madison, including **Henry Jenkins PhD'89**, of MIT and **Ted (Edward Bird) Castronova MS'88, PhD'91**, an economics professor at the University of Indiana who did the first major study of economic systems in multiplayer, online role-playing games.

CivCamp," she says. "We're trying to translate in-game data into something teachers can measure."

At the UW, the study of Serious Games — lingo for video games with uses far beyond entertainment — runs deep, incorporating academic specialties such as computer science, psychology, sociology, film studies, and art. The School of Education researchers credit the UW's environment, in which maverick approaches are encouraged, as a key reason their work has flourished in a competitive market.

While other programs now offer PhDs in games studies, Wisconsin's niche is unique, says Squire. "When you come out

with one of our degrees," he says, "people know what that means — looking at the intersections between games, how people learn, and how interactive technologies are transforming the world."

Squire and his colleagues hope to grow the program, which currently is a self-directed minor sporting fifteen graduate students.

"Five years ago, people told me, 'You're doing educational video games? You're insane! That's the dumbest idea! It's like you're majoring in broccoli-flavored spinach or something,'" says Squire. "It was laughed at — and now it's a multimillion dollar industry."

— *Aaron R. Conklin MA'93*

The Interpreter

Although more than five thousand students received UW degrees in May, it's doubtful that many can top **Matt Beyer '08's** last year.

Beyer juggled his classes with a full-time job as interpreter for Yi Jianlian, a promising Milwaukee Bucks rookie forward who also happens to be a superstar in the world's largest country. Beyer's language skills with Chinese and his journalism background landed him the position, which involved attending NBA games and practices with Yi and translating questions from American

reporters. High points for Beyer included luxury air and hotel accommodations, courtside seats for most of the season, and the chance to meet and converse with Yao Ming, another of China's most well-known athletes. Beyer isn't sure if he'll return to the Bucks next year, but the experience should guarantee a promising China-related career.

"I hope Yi learns English as quickly as possible," Beyer says. "It's a tool for him to be able to relate to people. I'm happy to see myself as a piece in the puzzle."

— *John Lucas*

Typically, UW-Madison's Office of Admissions looks at the grades of prospective students. But it gets graded, too, and according to the Web site College Confidential, the Badgers are at the head of their class. In a survey of students at the nation's most popular fifty universities, the UW received top marks as the **best admissions office** for the college search process.

Okay, you've graduated and left campus — so what has UW-Madison done for you lately? The **Wisconsin Idea in Action** is a Web site that shows the outreach and public service activities of university faculty, staff, and students. Check it out at www.searchwisconsinidea.wisc.edu.

Engineering professor Peter Bosscher (who was featured on the cover of *On Wisconsin's* Fall 2005 issue) passed away in November 2007, but his pet project, **Engineers without Borders**, lives on. After his death, Bosscher's family established a fund to aid the program that takes engineering students overseas to aid developing communities. With the assistance of the UW Foundation, the fund raised more than \$50,000, helping to get the UW's chapter of Engineers without Borders out of debt.

The UW Libraries' archives have made the **journals of Aldo Leopold** available online. The famed conservationist kept detailed diaries of his service with the U.S. Forest Service, his hunting excursions, and life in his Portage, Wisconsin-area shack, spanning more than half a century. The handwritten journals had been kept in the archives, but researchers can now access them through the Internet. To see scans of each page, visit digicoll.library.wisc.edu/AldoLeopold/.