

The Ohio State

# ENGINEER

Vol. 85 No. 1 Autumn '01

Plus:

Deans in Transition

IBM turns 20

Ginger is "IT"??

unlocking this puzzle

# FROM THE EDITOR

## A Season of Change

Change is all around every one of us. Some of us never notice this phenomenon—this change—while others are not able to cope with anything dynamic in their hopeful static lives. People can often yearn for change to seek excitement or improvement with their lives or their surroundings, while others attempt to grip tightly to the status quo that is so familiar to them. From the environment, to progression in life, to personalities and relationships, everyone must experience change. Here, at the aged academic and athletic grounds of what we call The Ohio State University, the autumn of 2001 exemplifies the evolution of our forever-changing university. Wherever we go—Ohio Stadium, Hitchcock Hall, South Campus, The Ohio State Engineer—there is change on this campus.

Walking the grounds of the Horseshoe, the battlefield of the commanding likes of Woody Hayes, Earle Bruce, and most recently, John Cooper, a new Field General has taken command of the Scarlet and Gray Army. His name is Jim Tressel. A former Buckeye assistant coach and Youngstown State head coach, Tressel was brought to Ohio State to produce a team of young men that can outclass and outperform our blue and maize nemesis to the north, win and dominate bowl games, and graduate at a steady and high rate. Amidst tough shoes to fill and a far from easy mission, Tressel is ready to lead his team, the Buckeyes, until his mission is completed.

Merely a few hundred yards due east of Ohio Stadium, along Woody Hayes Drive stands the structure that once housed the man responsible for building an alliance of industry and higher education. Dean of Engineering David Ashley once called Hitchcock Hall his home, but now, his home will be on the far coast of California, where he is helping to build an educational infant, the University of California at Merced, into a prestigious technical university. The man who needs to fill the College of Engineering's void is Materials Science Professor Jim Williams. Named Dean of En-

gineering, Williams hopes to continue where Ashley left off with the essential partnership of industry and education while also fostering growth in specific areas within the College.

Along with personnel changes in Columbus, changes are palpable amongst the curriculum and the way of life at Ohio State. First, the College Committee of Academic Affairs passed a new engineering core in the spring that will keep this university up-to-date with our university's national counterparts. Second, changing from a quarter-based university to a semester-based university has been a much-debated issue within Ohio State, with only time to tell what is in store for the students and faculty of our university. Next, with rampant weekend "riots" involving inebriated students and firm, unyielding police officers sweeping our campus during the spring of 2001, life outside the classroom will forever be changed. Similarly, slowly, but surely, the bars, dance clubs, and local food establishments that gave South Campus the character it was known for have begun to atrophy, clearing the way for the growth of newer, upscale businesses like Starbucks.

As seen at Ohio State, change is everywhere and is necessary in life. September is the month many freshmen lay their first foot in the dorms, their homes for the year and the grounds that will begin their journey toward their independence and future. These young scholars will need to adjust to a life away from home and associating with peers that were not with them at the Friday night football games and absent from the unforgettable dances of the year before. While these freshmen start the spring of their college tenure, the seniors will begin the winter of their stay at Ohio State and a final year to enjoy themselves as Buckeyes. New faculty, new students, and a new way of life can be seen this autumn. Being a part of the tide of change that is encompassing our university, as new Editor-in-Chief of *The Ohio State Engineer*, I welcome the freshmen and welcome back the upperclassmen to autumn quarter—a season of change.



**Editor in Chief**  
Dan Huynh

**Design Editor**  
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Melissa Benzel  
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David Lanier  
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Gabe Poling  
Kavitha Radhakrishnan  
Sunder Raman

**Faculty Advisor**  
Ed McCaul

**Graduate Advisor**  
Ranjit Annamalai

**Special Thanks to**  
Gina Langen

Office: Rm 181 Hitchcock  
Hall 2070 Neil Ave.  
Columbus, OH 43210

E-mail: OSE@osu.edu  
Fax: (614) 688-3805  
Phone: (614) 292-7931  
Web: ose.eng.ohio-state.edu

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*The Ohio State Engineer*

# News &

## Notes

compiled by John Howarter

### IBM Turns 20

It's not quite Big Blue, and it barely holds a candle to the Thinkpad, but we all had to start somewhere right? It was 20 years ago this August that a small company in Endicott, New York presented a machine that gave definition to the term "IBM-compatible."

IBM lagged behind peers in being the first producers of the personal computer, but its release was still significant. Its 16-bit processor outperformed the 8-bit processors offered by competitors Commodore and Apple. The IBM 5150 PC also featured software which would eventually be known as MS-DOS. This PC sold for just over \$2,600 (without monitor), which in today's prices is \$4,700.

### Expo Set for October 4th

The OSU Engineers' Council has organized the 2001 Engineering Expo. The 35<sup>th</sup> installment of this annual Expo will feature more than 100 companies set on recruiting engineering, architecture, and computer science students. The Expo will be held in the French Field House on October 4 from 9:00 to 4:00 and interviews will follow the next day. For more info go to <http://studentorg.eng.ohio-state.edu/~expo/>



### Engineering Course Requirements Change in 2001

Recently a change to the core curriculum for engineering students has been approved. The incoming freshmen in autumn 2001 will be the first class required to follow the new curriculum changes. Students already at the University will have the option of remaining with the old curriculum, or switching to the new set of required courses. One of the most significant changes is the deletion of Engineering Graphics 166, which is replaced by the more comprehensive Introduction to Engineering series. Other changes vary depending on specific major programs.

# Ginger

# She will knock your socks off

by Gabe Poling

IT is an invention that will “sweep over the world and change lives, cities, and ways of thinking.” According to Steve Jobs of Apple Computers, “If enough people see the machine you won’t have to convince them to architect cities around it. It’ll just happen.” “Expect ‘Ginger’ to be as significant as the development of the World Wide Web,” says Silicon Valley entrepreneur, and IT investor John Doerr. “It is a product so revolutionary you will have no problem selling it,” remarked Jeff Bezos of Amazon.com. “It will profoundly effect our environment and the way people live worldwide.”

This mystery invention that has come to be known simply as “It,” or “Ginger,” is a two (or one or four or six) wheeled, hydrogen-powered scooter, which is free. Although powerful select actually seen the has been wildly media and tech earth-shattering breakthrough. and his dream-engineers at

continue to keep the project very secret, which only adds momentum to the incredible buzz surrounding their revolutionary product. Kamen, for the most part unwilling to give away any details, has reported that the device takes ten minutes to assemble, will cost less than \$2,000, and should debut by 2002. The scooter is said to mimic how humans keep their balance in an effect Kamen calls “dynamic stabilization.” Powered by the highly efficient and low energy Stirling engine, and hydrogen fuel cells, Ginger could be the future of transportation and power.

Kamen is no stranger to innovation. He has created a number of completely revolutionary inventions, including a portable insulin pump, the heart stent used by vice-president Dick Cheney, and a wheelchair that can climb stairs. The arrival of Ginger has led to the creation of a new company called Arcos. The main focus of Arcos is to create products featuring motorized, self-propelled, wheeled personal mobility aids, of which the IBOT stair-climbing wheelchair is a part. The company is building a production facility in New Hampshire to begin mass-producing the highly anticipated scooter.



Master inventor and multi-millionaire, Dean Kamen.

Kamen is also the founder of an organization called FIRST, For Inspiration and Recognition of Science and Technology. The organization pairs high school students and engineers together to create robots that compete against one another for prizes and scholarships. FIRST is Kamen’s attempt to popularize science and change how American children view engineers, inventors, and scientists. Kamen uses the hype surrounding Ginger to help promote FIRST, yet another creation he plans to use to change the world.

Details about Ginger are still sketchy at best, with most coming from a leaked book proposal by Harvard Business Press, and a patent application filed with the World Intellectual Property Organization’s International Bureau. The initial feeling is that even if the scooter does not live up to its billing in changing the world, the technology of its high-efficiency, low emission, propulsion will no doubt be a tremendous breakthrough. But if Ginger can match even half of the hype that is surrounding it, the world is in for quite a ride: hydrogen powered, and emission-free.

Gabe Poling is a junior in electrical engineering. He can be reached for comment at [poling.87@osu.edu](mailto:poling.87@osu.edu).



# What's Under Your Hood?

*Are car owners trading raw performance for the illusion of an image?*

*Are automobiles becoming all show and no muscle?*

BY MIKE KRANTZ

An echo resonates down the street as the ground shakes below. "What could it be?" you ask yourself, imagining the grandeur of an high performance muscle car tearing recklessly and relentlessly down the street. Squinting your eyes toward the hazy sunlit street, hoping to catch a glance of this magnificent machine scorch down the asphalt, you see a Honda Civic slowly pass by with its parking lights lit. Its tires, two sizes too small, have been raised so that the car hovers above the ground with a spoiler large enough to be declared a monument rocking out bass that rattles the approaching stop light. It seems that everywhere young car enthusiasts have been trading in

their 6 cylinder engines and sports car suspensions for chrome exterior packages and 12-inch subwoofers. A society once driven by the great American sports car is now oscillating in the wake of these automotive mishaps. Does anyone care about true automotive engineering anymore, or has it all been lost to luster of these disillusion of performance? Worse yet, is the automotive industry following up on this latest craze, producing cars that serve more for image rather than performance, even at the expense of safety?

So what is it that has deterred people from their home auto garages and led them into the lure of custom car competition?

Looking into the past, it was always the passion of the young car enthusiast to tweak their cars. Though the car's appearance was an integral aspect of rebuilding a car, it was more crucial to know that they could tear past any other car at the intersection. This devotion to performance has now evolved into an age of show amenities, which have nothing to do with power, but have everything to do with appearance.

Some of the most obvious changes have been the use of spoilers and exhaust pipe tips. Intended for the sole purpose of intimidation, these add-ons contribute nothing to the function of the car. However, when loaded



*Left:* The General Lee, a 1969 Dodge Charger was forever immortalized by the TV show *Dukes of Hazzard*. The Charger was already considered a muscle car, but through its television fame and signature quick 180 degree turn-arounds to elude the cops, enthusiasts are sure to keep this model alive. *Below:* A 1964 Ford Mustang convertible still remains a quintessential American muscle car. Especially valued because 1964 was the first year Ford produced the Mustang, only 20% of the 120,000 produced were convertibles.



down with a custom audio system, most likely installed professionally rather than the owner, it is assumed by the competition that the car can reach the upward speeds of 150 MPH before maxing out the “supercharged” four-cylinder engine. This is quite the contrary considering the massive weight of the subwoofers housed in the trunk, along with the abnormally high-powered amp. These items would only impede the acceleration of the car. This is why most modern sports cars offer very little in audio systems, and typically strip the car down to the bone so that a reasonable weight can be attained.

Still, some other car companies have fed into the latest

fad of show verses performance. Commercials now boast the latest show amenities on the newest cars such as Dolby surround speakers or solid magnesium hubcaps. Thus, it is easy to see why the SUV wave has struck the market so abruptly. With their intimidating size, and image of power, consumers have been buying these gas-congesting beasts in enormous amounts. Still, what do these automobiles offer beyond leather seats and straight six cylinder engines? The fact of the matter is that these vehicles are more useful for social outings than off road terrain. Thus, it is easy to sell the public a product of pristine outward appearance, but horrid and sometimes fatal performance.

For example, national attention was recently directed toward SUVs habitually blowing tires and flipping over at highway speeds. This type of thing happens when more money and attention is directed toward the business of selling cars and less to the actual engineering of the vehicle.

Thus, the trend continues, as the meaning of automotive excellence is further lost into the shine of a glossy paint job and superior sound system. When all of the earth shattering bass echos into the horizon, what will be left for the true car enthusiasts to build upon other than an open chassis and a hollow hood? That will be left to the engineers of today, and more importantly, those of tomorrow.

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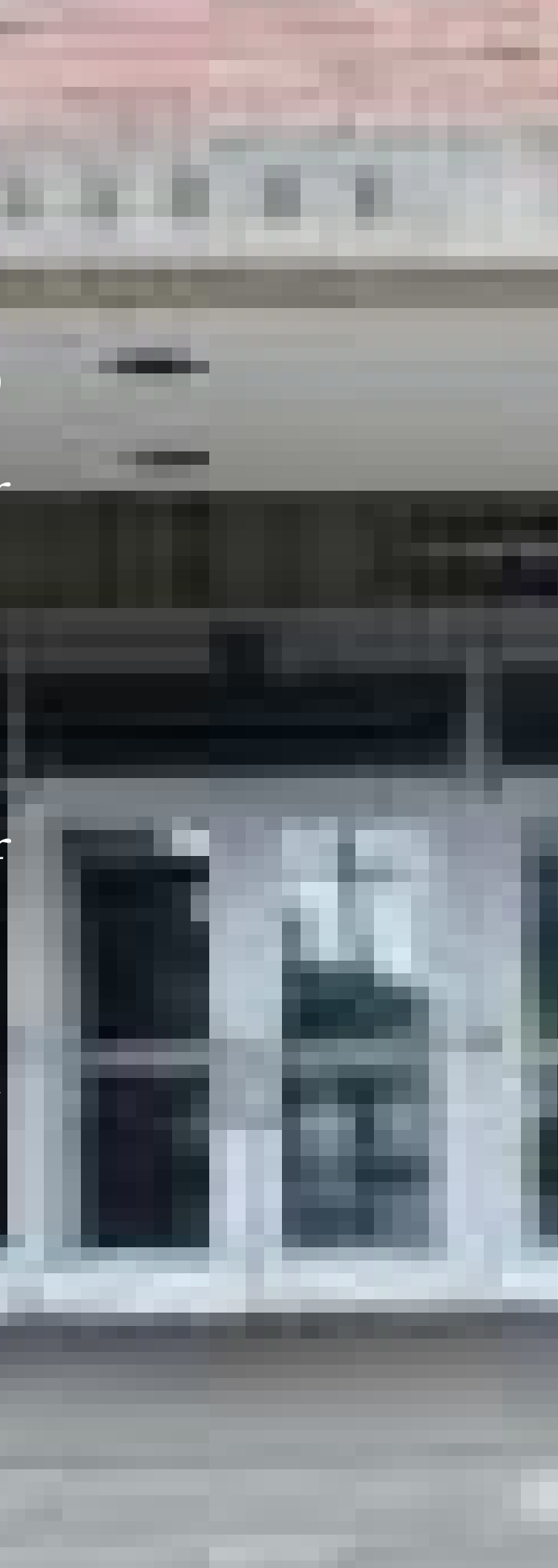
*Far opposite page:* SUV modified beyond utility. Could it even handle a speed bump?  
*Near opposite page:* A text-book case of appearance over performance, this car has it all from the spoiler to exhaust pipe tips, and don't forget the custom rims, tail light covers, and the ever useful product decals.

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*Mike Krantz is a sophomore in mechanical engineering with a passion for cars. He is also a member of the Ford Living Learning Program. He can be reached for comment at [krantz.15@osu.edu](mailto:krantz.15@osu.edu).*

*It may not be 1600  
Pennsylvania Avenue, and  
there was no drama to  
rival the fiasco in Florida,  
but behind the doors of  
2070 Neil Avenue, the  
College of Engineering  
experienced its own  
changing of the guard.*



*Dean David Ashley closes the door on his career at OSU, as he now sets his sights on new challenges in California. In his wake Dr. James Williams crosses over from the Materials Science Department to step in as the new dean of engineering.*

# A CONVERSATION WITH

A mere four years ago the College of Engineering was fortunate enough to welcome David Ashley as the new dean of Engineering at The Ohio State University. Many of the changes over the last four years can be traced back to the efforts of Dean Ashley. Recently Dean Ashley chose to leave his position at OSU for an opportunity to go to California and take over the reins at the newest addition to the University of California, the tenth UC campus, located in Merced. *The Engineer* was lucky enough to catch a moment of his time and ask him a few questions about his time at OSU, and his future at UC Merced.

## Is Image Everything?

When David Ashley first arrived at OSU, he had some of his work cut out for him. One of his main objectives was to build up the image of the College of Engineering. This goal still remains a work in progress, but Dean Ashley has taken great measures to achieve this goal, and it has paid off.



David B. Ashley

Ashley commented on his initial impressions of OSU, “I think that in the past we have had many good things going on in the College of Engineering, but not everyone knew about it. The College is

comprehensive in the way it deals with engineering and it is well respected among the companies who hire our graduates or do research with our faculty.”

Ashley, playing the role of publicist, was able to enhance public image through additions of both the website and the annual report of the College of Engineering. These serve as outlets to showcase many of the activities and accomplishments going on within the College. Dean Ashley has kept a busy schedule by being involved in external activities. He highlighted, “I think that I have spent a great deal of time outside the University trying to represent the University in different ways with many companies, serving on various boards, and in a variety of research activities.” Clearly, by increasing the visibility of the faculty and their programs, the benefits to OSU will be increased.

# DAVID ASHLEY

by John Howarter

During Ashley's tenure as dean, OSU has introduced a new "Introduction to Engineering" sequence for the freshman and greatly expanded the Freshman Honors Program in engineering. The College of Engineering has also moved to a much more direct enrollment. "All of these improvements I think will have a very big impact on the student experience," Ashley stated.

He continued, "An area in which I am really quite proud of is what has been done interacting with industry. Many formal partnerships have been developed with major corporations including Lucent, Northrop-Grumman, Executive Jet Aviation, and Honda of America Manufacturing." These relationships should produce great dividends for both parties involved, and will hopefully foster a bright future for the University.

## California Dreamin'

"What I have found is that almost no one gets the opportunity to do something from scratch," Dean Ashley remarked with a smile. Behind that statement, I, the interviewer, could see his face light up imagining the task ahead of him. "[Being the dean] is actually a fun job, and being an engineer I like to solve problems; if there is a problem it meant that I just started thinking like an engineer. In the end the opportunity to be the dean at UC Merced turned out to be too interesting and too compelling to pass up," Ashley explained.

His position at UC Merced will be a very unique one. Not only will Ashley be in charge of all



*David Ashley chats with students in one of the new Introduction to Engineering labs. Introduction to Engineering was one of the many new ideas brought to fruition during his tenure.*

the academic programs on the Merced campus, but for the next three years, until the first students enroll in 2004, Ashley will be able to create UC Merced essentially from nothing. Presently there are not even buildings for the campus, much less a faculty, or a set curriculum.

Ashley further remarked, "In the case of the Merced campus there is the freedom to choose what programs are wanted. You can decide if you want Industrial Engineering or if you are going to have Civil Engineering; there is the freedom to put emphasis on certain areas first. One of the things that is a real struggle at any University is to get very good interdisciplinary teaching and research programs. When you are starting from scratch that can be a priority right from the start."

Dean Ashley clarified this distinction, "I'll give you an example. OSU is going through a major analysis of whether they should switch from quarters to semesters. At UC Merced we just made the decision to go with semesters, so it's a much different decision."

The move to Merced is something of a change for the former dean of engineering. The Merced campus will include a Division of Natural Sciences and a Division of Humanities, Social Sciences, and Arts in

*cont. on page 21*

# Dean Williams: A

Before Dean David Ashley embarked to the west coast, spreading his knowledge and experience to the young newborn, the University of California-Merced, the Provost recognized that Ashley would be leaving a void in the dean's office at The Ohio State University. The Provost chose to fill the role of dean with a man that would continue Ashley's ideals of an alliance between industry and education, a man that would provide Ohio State with organization, strategy, and focus in years to come. That man would be the man Ashley hired only a few years ago as the Honda Professor of Materials Science. That man was Dr. James Williams.

## The Phone Call

"When the Provost asked me if I was willing to do the job, I told him that if he thought I could help him, I would be willing to do it for three years," commented Dean Williams when offered the title of dean of engineering. Williams did not seek out this prestigious position when he heard that Dean Ashley was leaving, but actually asked him to stay. Williams saw a man that had helped bridge a tie between corporations and OSU, firmly establishing OSU as an upper tier engineering school. Ashley had contributed so much to Ohio State and would continue to contribute if he stayed; however, Williams knew that Dean Ashley had an once-in-a-lifetime opportunity and respected his decision to leave. Nonetheless, that left a void in the College of Engineering.

Williams went on to explain, "When he made up his mind to leave, I just didn't think it was right to let the college drift while they [administrators] were looking for some leadership. In addition to getting us strategically focused, which I think is absolutely essential, my main job as the dean is to centrally participate in developing a real good list of strong candidates to be the next dean."



From 1968 to . . .

Williams receives a Metallurgy PhD in 1968 from University of Washington. Throughout college he worked off and on at Boeing.

# Deeper Look

by Dan Huynh

## The Man, The Mission

With budget restructuring, the College of Engineering could lose university funds if it does not create a solid strategy and specific goals for the college. “In a university, strategy means choice. Basically, you look at what you like to be, what you could be, and also, what you probably can’t be. You have to quit trying to be what you can’t be and spend more time and energy on the assets you do have in terms of people and facilities,” stated Williams. Dean Williams realizes that OSU cannot afford to spread its resources too thin, but should focus its efforts in specified areas on a more concentrated level. Recognizing the importance of his position, Williams has developed a simple plan to improve this college in order to carry on the Ashley legacy.

## Ohio State, Harvard, and the Perception Game

What separates the private Ivy League universities from public universities? Why do people speak the words “Harvard” and “Princeton” as if they were sacred realms? Many public institutions of higher education have equal resources, qualified faculty, and intelligent scholars. What makes “Harvard” stand out

### Industry and Higher Education: The Tie that Binds

Former dean, David Ashley made strong ties with companies such as Honda and Lucent during his tenure at Ohio State. Commenting on the matter, Williams thoroughly explained, “Our relationship with Honda is a very good partnership, and we’re working on similar things with other companies. A large public institution has an obligation to provide help in a variety of ways—from technology to continued education to distanced learning of second-degree opportunities to the employers of Ohio. If you look at the economic base of Ohio, it is heavily oriented toward manufacturing—Honda, GE, BFGoodrich, Timkin, and Proctor and Gamble.” Clearly, Dean Williams understands the importance of an alliance between industry and higher education. Started by Dean Ashley, these alliances, under Dean Williams, should prosper and be valuable to both industry and the university. Not only can industrial allies bring in funding and research equipment, but another valuable key to every upper echelon institution of higher education—perception.

... 1975

Williams is at Rockwell, starting in a research lab and working his way up to the corporate office.

Williams steps in as the dean of engineering at Carnegie Mellon in 1982.

**Rockwell  
Collins**

In 1975 Williams moves from California, to Pittsburgh, to join the faculty at Carnegie Mellon University.

more than “Ohio State?” The answer: Perception.

“I think OSU is a place, under President Kirwin’s leadership, that can get better than it is today both in reality and perception. Where higher education is concerned, perception is almost as important as reality.

All these rankings and so on are fundamentally a fairly sophisticated beauty contest. It’s not a very systematic, analytical process,” commented Williams. In the world today, the image and perception of the university are essential factors in the way people view the

institution. By looking deep down and reevaluating itself, Ohio State needs to be spending more time and energy on focusing its strategy of improving the University.

Dean Williams put it best, “We must decide what it is we want to be good at and what kinds of things we can be good at, and get those things to match up. Then, we must put the available resources into those areas rather than trying to be all things to all people because we are going to be perceived to be better if we put more of our chips behind fewer things.”

Image is very important in higher education. If several areas of an institution become very prolific in what they do, this situation will garner more public interest, resulting in an image much more powerful than an institution that is ordinary in every area.

### Semesters vs. Quarters: The Good, Bad, & Ugly

With the issue of the possibility of changing Ohio State’s quarter system into a semester system, many discussions have been made regarding the pros and cons of both approaches. Along with Northwestern and the

University of Cincinnati, Ohio State has been using a quarter system throughout the academic year. However, many other schools such as Duke, Vanderbilt, Indiana, and Notre Dame are on semester systems. Administrators have been considering switching for

some time and have met with students discussing their opinions on the matter. Commenting on the situation, Williams declared, “I think stringency in the university budget will inevitably slow down the transition to semesters even though that’s an important part in the academic plan. It takes resources to do that.”

Studying under a quarter system at the University of Washington and being a faculty member here at Ohio State, Williams has seen the pros and cons of the quarter system. Additionally, however, Dean Williams was a faculty member under a semester system at Carnegie Mellon. “I’ve had experience with both, and I think they both have strengths and weaknesses. However, if you want to take a stronger position on cooperative education, than it’s arguably

“...if you want to take a stronger position on cooperative education, then it’s arguably easier to do it with a quarter system...”



In 1999 Dean David Ashley convinces Williams to leave GE, and take a position at OSU as the Honda Chair of MATERIALS Science & Engineering.

Six years later, in 1988, Williams leaves academia for GE Aircraft Engines in Cincinnati.

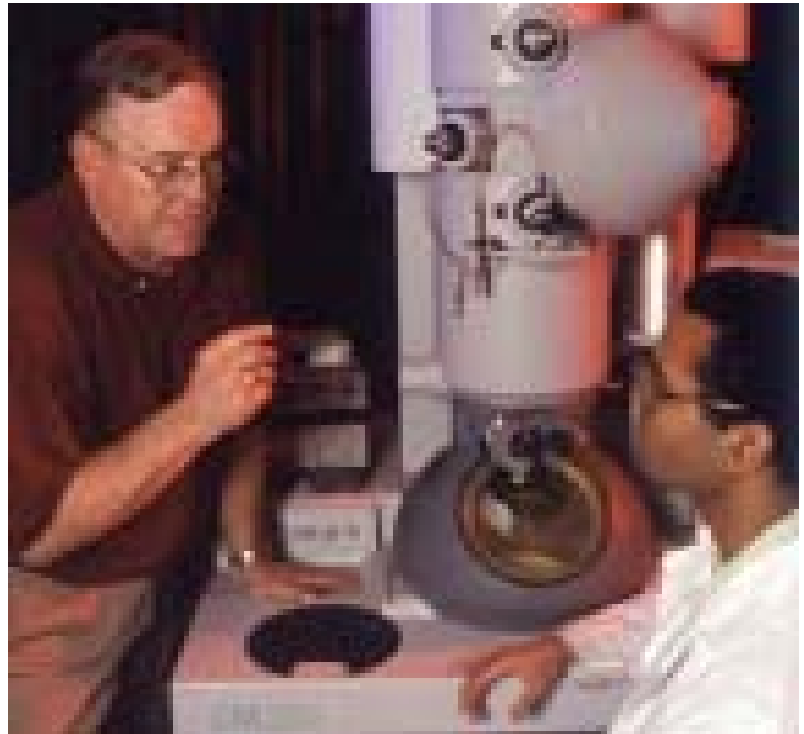
Two years later, as Dean Ashley departs, Williams fills his shoes as OSU’s new Dean of Engineering.

easier to do it with a quarter system because six months away is a long time,” commented Williams on his take of each system. Williams goes on to state, “With quarters you can have the faculty not have any major teaching responsibilities for a quarter. It’s not realistic to do that for a semester. The downside of quarters, in my personal view and experience, is it takes one class period to get a new course and a new class up and running. There are all kinds of housekeeping stuff. How many exams are you going to give, and what do you do about homework? With the quarter system you do that three times in an academic year and in a semester system you do that two times. In essence, you can argue that the quarter system has more overhead associated with it.” Guided by his comprehensive knowledge and experience with both academic calendars, Dean Williams will provide beneficial knowledge and experience to the university regarding the question of changing from quarters to semesters.

### **Lending Out a Helping Hand**

“I think cooperative education is an important dimension in engineering, and one of the things I’m going to have to look at is that area. We need to look at where our students are going and what the university is doing to help them find a challenging job. The university has the obligation in the co-op program to work with the employers to see if the employers give the students challenging assignments and not just treating them as a pair of hands,” commented Williams regarding “real world” engineering experience during one’s undergraduate years. At General Electric Aircraft Engines in Cincinnati, Williams always worked with ten

to twelve co-ops in his department. Often, these co-ops were used as merely a set of hands to do busy work. Disgusted with the co-op treatment at the plant, Williams explained, “I instituted a practice of having lunch with the co-ops about every other month. We’d just sit in my conference room and have sandwiches



*Professor Jim Williams and Vikas Sinha, a postdoctoral researcher in the MSE department, talk about the transmission electron microscope in the background. Dr. Williams has been advisor or co-advisor to 16 doctoral students and 4 masters students.*

and talk about what they are doing. For the folks who were doing lousy stuff, I’d ask them who their manager was, and when they left, I’d have a nice little phone call with the manager. It’s amazing how over time, the co-op assignments seemed to improve in quality.”

Today’s college students are tomorrow’s designers, innovators, and leaders. Dean Williams acknowledges this simple fact and has openly stood up for the intellectual stimulation and well-being of the undergraduate. Williams sees the young engineer as one who needs guidance and challenge in order to succeed, instead of the repetitive busy work to consume

*cont. on page 21*



# Method or Madness?

## The Wexner Center's Design

The Wexner Center for the Arts, built in 1989 as a modern art museum for The Ohio State University, has invoked controversy on campus due to its unusual design. Is it a non-sensical, displaced, chopped-up piece of sculpture that disgraces our campus? Or does it challenge our preconceptions about architecture? Even

upon understanding the design purpose, method and results, the debate continues as to whether the design intent was successful in its final presentation.

Peter Eisenman (1932 - ), the architect designer for the Wexner Center, began his design process by locating two grids that intersect the site; one that organizes the campus and the other that organizes the street fabric across High Street. Upon analysis of the site plans, he found one axis, or path, that connects the

two grid systems. Seen at helicopter distance, one notices that the orientation of the street grid east of High Street, if continued through the Wexner site, the Oval and through campus, lines up with the front façade of the Horseshoe Stadium. Therefore, the museum was designed to lock into the two grid organizations that permeate the building site. The axis through the two grids is picked up in the exterior passageway through the building. Eisenman would argue that orienting the building according to these city grids gives the museum a meaningful social and geographical context. However, who would know it? The scale of the connection Eisenman made between the two

by Stephanie Aurora Miller

grid systems is beyond human perception. However, is it possible that we do perceive the shift between the campus grid and the city grid in our subconscious, causing us to indeed relate to the appropriate orientation of the building?

To lock the building into its historical context, the shape of Eisenman's building was initially taken from the floor plan and imagery of the old Armory that stood in place of the current Wexner Center. The Armory, once a military building, then converted into a gymnasium for the campus, replicated a French castle with four turrets at each corner. Eisenman drew the "footprint" of the Armory on the site map four times, each one rotated. With the four intersecting building footprints, he began to reshape the image of the former building into a sculpture of modern art. The building became a metaphor for the purpose inside where reality (the image of the former Armory) is fractured in modern art and the rep-

lication of "real" is altered by another force such as emotions, movement, worldviews etc. The design intent is excellent, but seemingly ineffective because the historical reference is imperceptible to the average student who is not familiar with the memory of the Armory.

Eisenman is not a typical architect in that he designs with complex methods. He designs gimmicks, tricks or rules and then allows those systems to create a building through self-generation. It

**“Architecture is not about brick, long relentless corridors, pancake stacked floors and word signs pasted on the walls ...”**

is very similar to programming a computer where the human programs it, the computer uses the "rules of logic" assigned to it and then it is free to generate the results. Frequently, the results are not perceivable when viewing the final

project. This is best understood in a three-dimensional rendering software program where an object is manipulated by certain functions, such as "unfold," to produce a result beyond typical human capacity. Moreover, the computer is a tool that designs interesting spaces, allowing the human to experience life "out-of-the-ordinary."

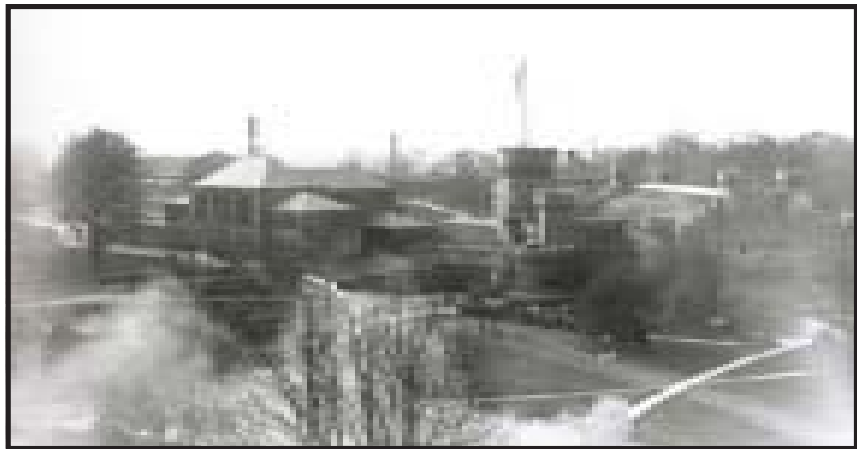
Some of the design motifs Eisenman used in designing the art museum are rotation, movement, and overlapping and overlaying. The floor plan was rotated, creating an intersection of volumes. The broken turrets give the illusion of movement. Specifically, it represents the demolition of the Tower, which was a momentous occasion and photographed on the cover the campus' literary issue, "Monthly." By using brick, steel and wood, he varies the degree of experience through the building. The sensibility of the human, walking through the space is enhanced by a variety of materials.

In all the hype about philosophical, anthropological, sociological, geographic, artistic and academic references in Eisenman's work, he is clearly not as concerned about the actual realization of the project ideas. The construction and

engineering of the building was outstandingly difficult. Do we believe that all that extra effort is necessary or meaningful?

Why should we not live outside of the boundaries already delineated - not in a disrespectful manner but in an exploration of further possibilities and deeper understanding? The gridded walkway that protrudes out from the structure of the building and into the interstitial space between the Wexner and the Mershon is an armature of experience. When walking linearly through the grid on ground level, the lines of the grid point up toward another center point, not on the horizon of our normal existence, but above us. So, the perception of our reality is distorted. Do we not enjoy this game, as if it were a roller coaster or a movie where life is beyond reality? Walking up and down the central staircase, going from the upper lobby to the museum entry spaces below, the columns that intersect the upper part of the circulation space also distort our perception of reality. It appears as though we will hit our heads when ascending the stairs.

Distortion of reality by



*The French Armory, used by Ohio State University's ROTC in the early part of the 20th century was a predecessor to the Wexner Center in both its location and style. Picture taken in 1913.*

playing tricks on our perception is part of the Post-Modern theory. Non-sequitur logic and fractal geometry are a close approximation of the ideas present in Eisenman's Wexner Museum. So why would an architect be interested in playing these games and tricks on the human eye and hand? Architecture designs the movement we make through a space or an environment. Occasionally, we stop, do some sort of activity and then progress to the next pod, or site of activity. Things happen when we move from one pod to the next. Certain things

come in and out of view, the activities change. Why wouldn't the architecture change with the people? If you look at our human anatomy or our human behavior, it is not neutral, blasé and monotonous. If we were emotionless, solid masses of white undifferentiated material, then the long monotonous corridor with a door on the right and a door on the left would be what we could call "home."

In my opinion, architecture is an exploration of understanding our world and creating an environment suitable to the place and use of the building. Eisenman made great efforts to set the Wexner Center museum into the social, geographical and historical context of its site at The Ohio State University. It should be better explored whether or not this is what architecture is about or if the design intent and results of the Wexner Center were successful.

*Stephanie Aurora Miller is a typical graduate of Sarah Lawrence College in Bronxville, New York. Although she greatly enjoys French and dance, Architecture History, Design and Theory is her great love. She will graduate with a Masters of Architecture Studies in the Spring of 2002.*

*One of the Wexner Center's gridded walkways, another distortion of reality.*





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# SCENES FROM THE COLLEGE OF ENGINEERING

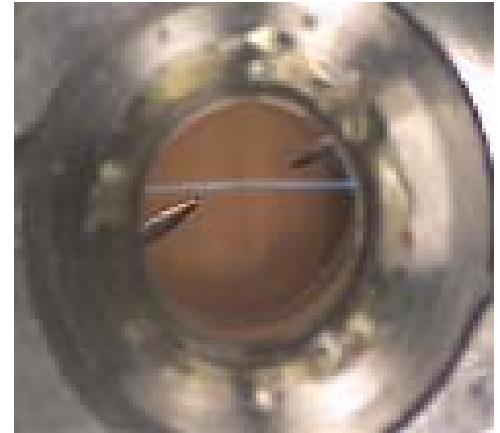


Profile view of the Laden Swollo, built by the SAE Cargo Plane Team. She made her maiden flight on June 9, 2001. She made her final flight on June 10, 2001 while hauling 24.5 pounds of cargo. <http://studentorg.eng.ohio-state.edu/~saecargo/>

The Smokin' Buckeye is an electric car built by the Society of Automotive Engineers (SAE) Formula Lightning Team. The 2001 version maxed out at 144.2 mph. It runs on 31 12-volt Optima lead acid batteries. <http://www.smokinbuckeye.com/>



A low-power laser beam (blue horizontal line) cuts a path between two electrodes in a weld chamber. With Ohio State's Laser Assisted Arc Welding process, this beam -- which uses little more wattage than a Christmas tree light bulb -- can guide a welding arc as well as a typical multi-kilowatt laser. <http://www.osu.edu/researchnews/archive/arclaserpics.htm>



Close up view of the 1999 OSU formula race car constructed and raced by students of the Formula SAE Team. <http://www.formulabuckeyes.com/>



The OSU Research Reactor seen through the reactor pool from above. The blue glow is Cherenkov radiation, which is visible light emitted when charged particles are travelling through a transparent substance (such as water) faster than light travels through that substance. For more information: <http://www-nrl.eng.ohio-state.edu/>

*cont. from page 11*

addition to the Division of Engineering, all of which is designed to serve up to 25,000 undergraduate students. The new environment at Merced will still be familiar territory for David Ashley who will not only bring his experience as a dean at OSU, but also experience as the chair of Civil and Environmental Engineering at UC Berkeley. Like the Merced campus, UC Berkeley is one of the ten campuses of the University of California. Thus, for Ashley this career move is something of a homecoming for him.

### **Bon Voyage**

Dean Ashley is leaving OSU in better condition than when he arrived, but that is not to say that the College of Engineering has met all of its goals. When asked what he thinks the focus of the incoming Dean, Ashley replied, “I still think we need to become more visible. It is a great College of Engineering, but it is not truly appreciated by the external community. We need to continue to focus on making our story known outside, because it is a good story.”

Dr. James Williams, Honda Chair of the Materials Science Department, will be succeeding Dean Ashley, who coincidentally, was involved in recruiting Dr. Williams from GE Aircraft Engines. Reflecting on that idea Ashley remarked, “I think Jim Williams has been a wonderful addition to the faculty, I think he is going to be a terrific dean; I think he has the attributes to be an outstanding dean.”

*John Howarter is a junior in materials science and engineering. Though engineering keeps him busy enough, he has also found time for his new hobby “the magazine.”*

*cont. from page 15*

the day. In the fast-pace and impersonal world of public institutions of higher learning, Williams brings to the University exactly what it needs: a compassionate leader.

### **Planes, Brains, and Automobiles**

Discussing why he accepted the offer to be the Honda Professor at Ohio State, Dean Williams explained, “For me, the attraction was to learn something about the car business because I worked for the aerospace business my whole life. So, I spend a fair amount of time at the Honda plant, trying to see what we can do to help them and what things they can do to help us.”

As seen in his lifetime, dean Williams is a man that demands challenge. Whether working the swing shift at Boeing as an undergraduate student or working in industry or teaching, Williams has always sought to gain more knowledge and take on a wide variety of tasks. Our new dean is a learner, a thinker—a student at heart.

Dean Williams proves that the dean is not a figurehead, but a man that cares about the University as a whole, as well as the building blocks of it, the students. Always seen helping and socializing with his students, assisting the University in times of need, and strategizing plans for the future, Dean Williams has shown that the College of Engineering is headed in one direction—up.

*Dan Huynh is a junior in electrical engineering. He is a former participant of the FEH program, and currently interning for IBM. He can be reached for comment at huynh.34@osu.edu.*

# The Incredibly

SMALL

# Future of Sound

by Arhan Gunel

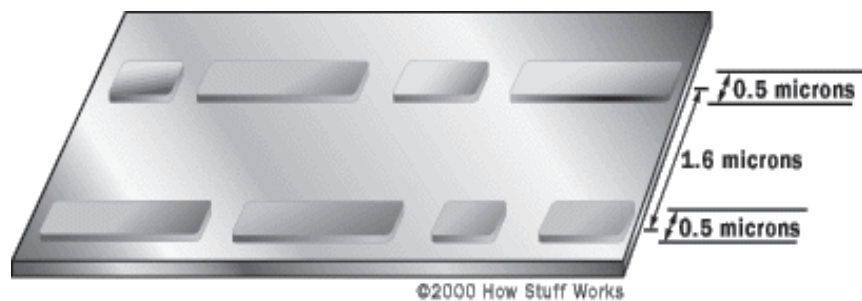
Take a piece of paper and roll it up like a cone. Attach a needle to the small end and tape it closed with some tape. Congratulations! You have just reinvented (or at least imagined yourself reinventing) Thomas Edison's phonograph. Tape a pencil into the hole of any record of your extensive vinyl collection so that it will spin and you can be movin' and groovin' in no time. In fact, your little homemade contrivance could have better sound quality than a Sony CD player... sort of.

In an analog recording, such as vinyl, the exact physical vibrations are etched into the disc. As the player needle moves along the surface of the disc, it will vibrate with the same frequency as the sound that was recorded onto the disc, equating to almost perfect sound quality.

Of course, sound quality can be measured in different ways. The problem with vinyl is that even a speck of dust caught in a groove on a record can cause the needle

to vibrate inaccurately, thus producing the crackling sound equated with vinyl records. Also, as someone plays the record over and over, the needle scrapes the vinyl time and again. Soon, the needle begins to wear down the material, reducing the accuracy of the original recording, hence reducing sound quality.

125 nanometer thin film of aluminum. Unlike a vinyl record, the information is not held in varying depths of etches, but rather in a digital format, bumps and pits. As the disc spins, a laser beam is shot at the disc. If there is a bump, then the laser light will be reflected to an optic sensor and the CD player will



A greatly enlarged view of the continuous track (only .5 microns wide) of bumps and pits on the

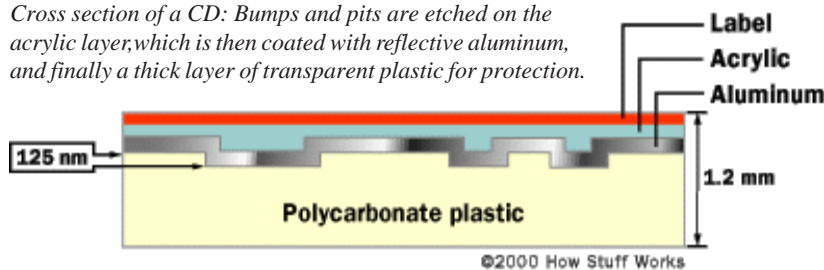
These obvious problems along with the advent of digital technologies spawned the compact disc. Most of a CD is composed of some type of a polycarbonate plastic which gives the CD its shape and durability. The part of a CD that holds the sound (or in more general terms, data) information is a

read a high bit. Pits divert the laser away from the sensor and a low bit is processed.

Because the disc never actually comes into physical contact with anything, CDs are obviously a much more reliable medium of storage than vinyl. Also, dust particles don't interfere with the laser and are not a problem. So then, if CDs are this great, how is it that your generic phonograph could be superior to a Sony CD player?

CDs must store information in bits, meaning that they are contained in the number of individual

Cross section of a CD: Bumps and pits are etched on the acrylic layer, which is then coated with reflective aluminum, and finally a thick layer of transparent plastic for protection.

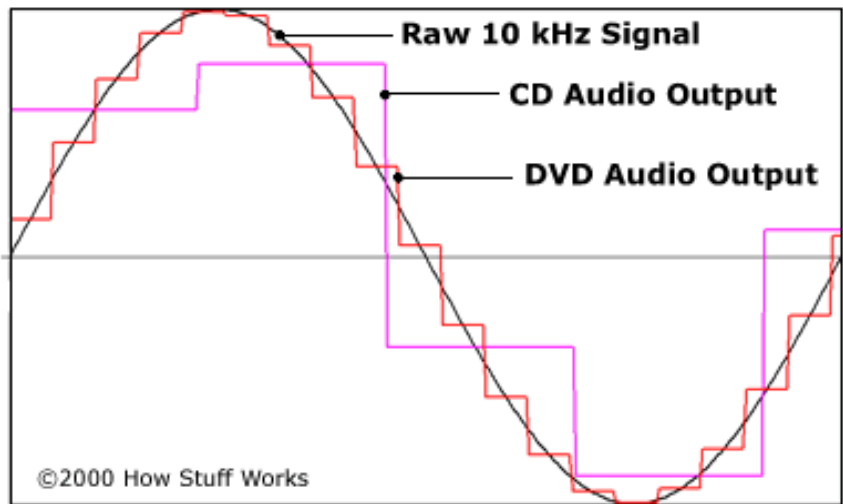


frequencies that they can emulate. For example, suppose that only a single bit is used to store every second of information, meaning that the player could only translate a high frequency and a low frequency every second. Two frequencies every second does not make for very interesting music. Of course, two bits would sound a bit better, but still doesn't quite make a symphony. Even though CDs in actuality pump approximately 705,600 bits through a digital converter every second, an expert can still tell the difference between a digital recording and the real thing.

One way to fix this problem is to simply add more bits of information. Eventually no one will be able to tell the difference. The problem is, of course, figuring out how to cram all of this information into a space small enough to be practical.

A technology called lithography, which also used to manufacture computer chips, uses laser beams to etch the bumps into CDs today. Stephen Chou of Princeton University uses a form of that technology, ingeniously entitled electron lithography, because it uses actual electrons instead of light. Because the wavelengths of electrons are much smaller than that of controllable laser light, it is possible to make much smaller grooves in the material. Chou has created discs that hold 800 times the information of a CD in about the size of a penny.

Now, how are these insanely small grooves read? Forget lasers and get out your needle and rolled up paper, cause it's time to play them oldies! Only this time you will need a really small needle



As CD/DVD technology advances, digital sound is able to more closely mimick a wider range of frequencies, ultimately producing a more natural sound.

about the size of the tip of an electron microscope. The tip of the needle does not actually need to touch the disc though. It does, however, come so close to the disc that atomic forces from the electrons in the disc material actually repel the needle. When the needle passes over a pit in the disc material, there is less atomic force acting on it. This change in force is measured by the disc player and interpreted.

With such incredibly high amounts of data able to be stored

in such a small space, recordings will be able to sound much fuller and richer without the drawbacks of vinyl. Sound never sounded so good.

For more info check out <http://www.howstuffworks.com/cd.htm>

*Arhan Gunel is a junior electrical engineering major. Over 10 feet tall, he can shoot jets of acid from his fingers and exhales gusts of scorching fire breath that rival the trade winds of Libya. Most people respond to this with, "What?!" Arhan confidently quells their inhibitions by saying, "Yeah, I'm not sure either." He can be reached for comment at [gunel.1@osu.edu](mailto:gunel.1@osu.edu)*

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