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ITEMS

UNIVERSITY OF MINNESOTA
INSTITUTE OF TECHNOLOGY



COVER STORY:

The look of the past
The shape of the future Pp. 4-7

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University of Minnesota
Institute of Technology

Fall 1988

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Items is published three times a year to inform Institute of Technology alumni and friends about news, interesting alumni and faculty, and relevant issues. Letters to the editor, requests to receive *Items*, and notices of address changes should be sent to the Office of External Relations, Institute of Technology, 107 Walter Library, 117 Pleasant St. S.E., University of Minnesota, Minneapolis, MN 55455. *Items* welcomes letters and ideas from all readers.

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The University of Minnesota is an equal opportunity educator and employer.

About the cover: Serious and dedicated, students in this 1926 photo of the main engineering library probably understood the historical space problems faced by electrical engineering and computer science. See what a new \$44.3 million building (inset photo) means to those two departments (pp. 4-7).

NEWS

New IDEAS help engineers manage

In all likelihood, the seminar that professors Warren Ibele and Mischa Penn taught last spring went unnoticed by the rest of the University. After all, a discussion of C.P. Snow's *The Two Cultures* among about a dozen IT and CLA students is all in a day's work at a university. Nevertheless, when Ibele, a professor of mechanical engineering, and Penn, an associate professor of anthropology, teamed up, they did more than take part in a routine academic exercise. Their joint effort symbolized a renewed interest in offering students a more well-rounded education.

Now, with the help of a \$3 million endowment from Honeywell Inc., the University can offer students that broader education. Most of the endowment—\$2.7 million—will be used to establish the Center for the Development of Technological Leadership. The remainder goes to the School of Management, which will play a part in the training of engineers.

The center has three major components:

- An undergraduate program, called IDEAS, or Integrated Degrees in Engineering, Arts, and Science, emphasizing collaboration between CLA and IT. Students enrolled in this program will graduate with a degree from both colleges. While that has always been possible, IDEAS stresses the importance of pursuing a broader education, and offers scholarships that make it easier for students to stay an extra year to complete a dual degree. Special courses, such as the seminar led by Ibele and Penn, will be a feature of the program.

- A master's program in collaboration with the School of Management, emphasizing management skills for engineers who have been working for several years.

- A research and experimentation program, focusing on technology transfer and issues of technology leadership. Another activity, the Honeywell W.R. Sweatt Lectures in Technology Leadership, supports all of the center's components. This spring, the series featured Lester Thurow from the Massachusetts Institute of Technology, Richard Cyert from Carnegie-Mellon University, Charles House from Hewlett-Packard, and Bernard Gordon from Analogic Corp.

"Engineering has become increasingly narrow and specialized, and the requirements are intense for someone trying to get through a course in almost any university in the country," says William T. Sackett, a retired Honeywell executive who now works as a part-time associate dean to help launch the new center. Such specialization leaves students little time to explore other academic fields, he says.

Yet corporate leaders are sending a message that they want well-rounded engineers who understand some management principles, Sackett says. The message is simple: "We need competent engineers, but we'd like them to be a little more sophisticated about what they'll encounter in the real world."

The center provides a starting point toward that end, says Russell Hobbie, IT's associate dean for student affairs. While it



won't be able to reach the majority of IT students, it can, he says, "provide a cadre of engineers who are more broadly educated." What's more, there should be a ripple effect, so that classes developed for the center eventually may be incorporated into the general curriculum.

The drive for a more well-rounded student comes in part from increased international competition, according to Honeywell's vice president for science and technology, Gerald P. Dinneen. "The key problem in making American industry more productive is taking the technology we have and turning it into a better product."

That calls for a new approach, Dinneen says. The old way of developing a product serially, with engineers doing one job, production doing another, and so on, no longer applies in today's world. There's a need for "much more of an integrated process, where all work together," he says. "The engineer has to have some appreciation for the management aspect of the business."

Nobody is singling out engineers for a fuller education, however. "I would also argue that managers have to understand more technology," says Dinneen.

The center, with its emphasis on merging science and the humanities, may in fact be an old idea in a new package. Roger Jones, associate professor in the School of Physics and Astronomy, says there was a time when physics, chemistry, and the sciences were part of the College of Liberal Arts. "The older thinking was that science is part of the liberal arts," says Jones, who taught a seminar for IDEAS last spring, with Ellen Messer-Davidow, an assistant professor in the English department. "It's typical of today's thinking that science is associated with technology."

Jones notes that even the humanities glorify technology in the trend to quantify research. "The trend should go the other way," he argues, with more emphasis on ethical, aesthetic, philosophical, and metaphysical issues. The Center for the Development of Technological Leadership "is a step in the right direction, and I applaud the effort," Jones says. **I**

By Miriam Feldman

Unisys donates equipment

Unisys Corp. donated equipment valued at \$2 million to IT's Microelectronic and Information Sciences Center (MEIS) in May.

According to IT Dean Ettore Infante, the donation significantly addresses IT's sophisticated equipment shortage and demonstrates the industrial community's confidence in IT. Unisys had used the equipment, an electron beam pattern generator, in its semiconductor fabrication plant in Eagan, Minn.

MEIS is an interdepartmental center that brings together IT faculty, graduate students, and representatives from industry to cooperate in research, education, and information transfer. **I**

A giant step...

The first public meeting of an active U.S. astronaut and an active Soviet cosmonaut occurred at the University in April, when astronaut Brewster Shaw and cosmonaut Alexander Ivanchenkov discussed the possibilities of a joint American-Soviet mission to Mars.

The meeting was part of Student Space Week '88, a four-day conference hosted by the University's chapter of Students for the Exploration and Development of Space. Other Space Week events included an international space symposium; talks on corporate and student involvement in space; and space exploration lectures. **I**

Photo by Patrick O'Leary



CME's new rock sculpture, "Science Genesis"

Gneiss sculpture honors a nice Fellow

The Cold Spring Granite Co. presented a rock sculpture to the University in June in memory of John Conrad Jaeger, frequent visiting faculty member in the Department of Civil and Mineral Engineering, who died in 1979. A Fellow of the Royal Society, Jaeger was internationally renowned for his contributions to applied mathematics, geophysics, and rock mechanics. He was a popular lecturer at the University's annual short courses on rock mechanics, and he met many Cold Spring employees during short-course demonstrations held in the granite company's quarries.

David J. Bennett, architect of the Civil and Mineral Engineering Building, designed the sculpture, which stands in the building's rotunda. The sculpture's rock is Morton gneiss, one of the world's oldest rocks, and comes from the Cold Spring quarry.

Following the sculpture dedication, Neville G.W. Cook, the Donald H. McLaughlin Professor of Mineral Engineering at the University of California, Berkeley, delivered the first J.C. Jaeger Lecture. **I**

An inspiring force

Thermo King Corp. of Bloomington, Minn., donated \$50,000 to endow a minority student scholarship program in IT. The gift was given in memory of Frederick McKinley Jones, a self-educated black engineer.

Jones, with Minneapolis entrepreneur Joseph A. Numero, built the first transport refrigeration unit in 1938. Based on their invention, Numero founded Thermo King Corp., which continued to build on Jones' designs and still uses his concepts.

Thermo King Corp., a subsidiary of Westinghouse Electric Corp., donated the scholarship with Westinghouse Foundation support. Matched by University funds for a total endowment of \$100,000, the gift will support at least one undergraduate student per year. **I**

Physics classrooms receive facelift

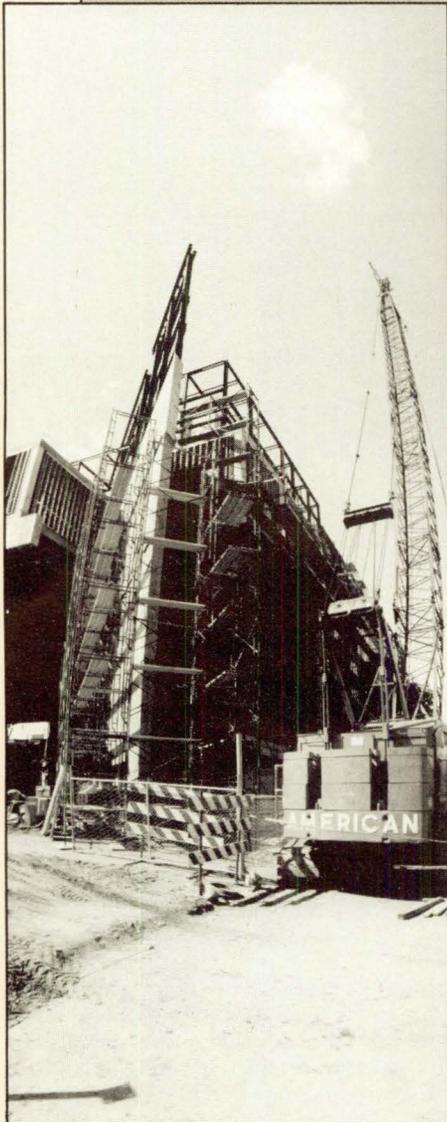
Six classrooms in the Physics Building received much needed renovations over the summer. The repairs were phase one of a four-building, 13-classroom renovation project scheduled for the summers of 1988 and 1989. Funded by a 1987 \$2.8 million legislative appropriation, the project aims to upgrade some of the University's most heavily used and dilapidated classrooms.

Physics Building repairs include electrical upgrading, new lighting and audiovisual systems, acoustical improvement, and fresh paint, according to Charles Koncker, a senior architect coordinating the project's construction. Exits were added to several classrooms to comply with safety regulations, and three rooms, those with the oldest plywood seats, received new furniture. All six classrooms should have functional air conditioning by the end of fall quarter 1988, says Koncker. **I**

News to p. 13



Honk on red. Electrical engineers of the 1930s regulated stoplights with horn sounds. It didn't catch on. Inset: The hole before the building. Left: The structure takes shape.



There's No Place Like Home

Electrical engineering and computer science follow the yellow brick road to a new building

By Chuck Benda

Although they were born 83 years apart, the electrical engineering and computer science departments shared a common fate in their early years: neither had a home of its own.

Electrical engineering, established in 1888, spent the first 36 years of its existence bouncing from building to building, scrambling for office, laboratory, and classroom space—and, ironically in retrospect, for students. The completion of the Electrical Engineering Building in 1924 solved most of those early problems. During the next half-century, however, electrical engineering outgrew the building, and technological advances rendered the laboratories obsolete.

Computer science, established in 1971, has never lacked students, but it, too, has found itself housed in spare offices and temporary quarters throughout its

existence. Today, electrical engineering and computer science students constitute roughly one-third of IT's entire enrollment, and the continued development of these two departments remains high on the IT agenda for the next several years.

The completion of the new Electrical Engineering and Computer Science Building—now the flagship of the Institute of Technology—marks the beginning of what many people in IT hope will be a new era of growth and national prominence, and the end of scattered offices and libraries tucked under stairways.

From semaphores to semiconductors

If the electrical engineering department had started any sooner, there probably wouldn't have been much to study. The world's first public electric



power plant began operation in London in 1882. In 1888, Nikola Tesla patented the induction motor.

As it was, the fledgling department had difficulty attracting enough students to merit department status. The entire enrollment of the old College of Mechanic Arts, to which electrical engineering belonged, was 18 students. The first electrical engineering class to graduate, in 1891, consisted of two students. For the first several years, George D. Shepardson was both the department head and the faculty, teaching all of the electrical engineering courses—and a few physics courses, just to keep himself occupied.

After spending several years in different buildings, in 1902 electrical engineering moved into its own new building. As rapid campus growth created conflicting demands for funds, the University soon abandoned its plans to expand that building into an engineering laboratory complex. By the time the University turned its attention back to the electrical engineering department, it was 1924. The building then constructed on the east side of Church Street next to the Main Engineering Building (now Lind Hall) became the department's home for the next 64 years.

When it moved into the new building, the department had grown from a one-man faculty instructing a handful of students to a faculty of eight instructing four graduate students and 146 upper-division undergraduate students. The building contained (as we have grown so fond of saying these days) state-of-the-art classroom and laboratory accouterments: "heating, plumbing, lighting...[and]...electric circuits being actually or potentially installed so that any room may be readily electrically connected with any other without any wires being exposed to view," as Shepardson wrote in his 1924 *Historical Sketch of the Electrical Engineering Department*.

In addition to offices, classrooms, and laboratories, the building included an exhibit room intended to acquaint students and the local citizenry with "modern electric appliances," and a museum that detailed the development of early light

fixtures, dynamos, motors, lightning rods, and other electric devices. On the building's roof stood two 90-foot radio towers for the study of communications technology.

One of the department's earliest research and development projects involved traffic control equipment, including a device that allowed drivers to regulate the duration of red and green lights on semaphores by blowing their horns. Imagine rush hour nowadays if the device had gained widespread use.

Enrollment during this period (1924-30) hovered around 400, but it dropped rather abruptly to less than 300 in 1932, presumably on account of the Depression. The Depression, however, didn't have nearly as great an impact on enrollment as did World War II. By 1944, enrollment had plummeted to just 90 students. As professor emeritus Paul A. Cartwright explains, however, the electrical engineering department inherited a new kind of student to fill its classrooms.

"The Navy was expanding rapidly during the buildup for World War II," Cartwright says. "As the new ships came on line and were commissioned, they had to have trained technicians capable of operating the various electrical systems. They weren't prepared to train all these people."

The Navy wasn't, but the electrical engineering department was. From 1942 to 1945, the department trained some 3,000 electrician's mates. Every two weeks a new company of 125 recruits would arrive, fresh out of boot camp. In 16 weeks the electrical engineering faculty would teach them all they needed to know to operate the electrical systems on a battleship, cruiser, or submarine.

"It was hard work," Cartwright says. "We had classes six days a week, year-round. The only holidays we got off were Christmas and the Fourth of July."

It was also heartbreaking work, at times.

"You got to know the boys pretty well," he says. "When a battleship or a cruiser went down, we sometimes lost a whole company. Like when the Lexington

Up it goes. The \$44 million structure contains more than 158,000 square feet of classrooms, offices, laboratories, and study areas, making it the largest academic building on campus.

was sunk. Or the Saratoga."

When the war ended, enrollment jumped to an all-time high of some 1,400 students as returning GIs took advantage of their educational benefits. Again the department made rapid adjustments. Cartwright, who earned his bachelor's degree in electrical engineering at the University in 1937, stayed to help with the crunch, eventually becoming a full professor and then IT assistant dean for student affairs before he retired in 1979. In 1987, Cartwright compiled a book on the history of the electrical engineering department.

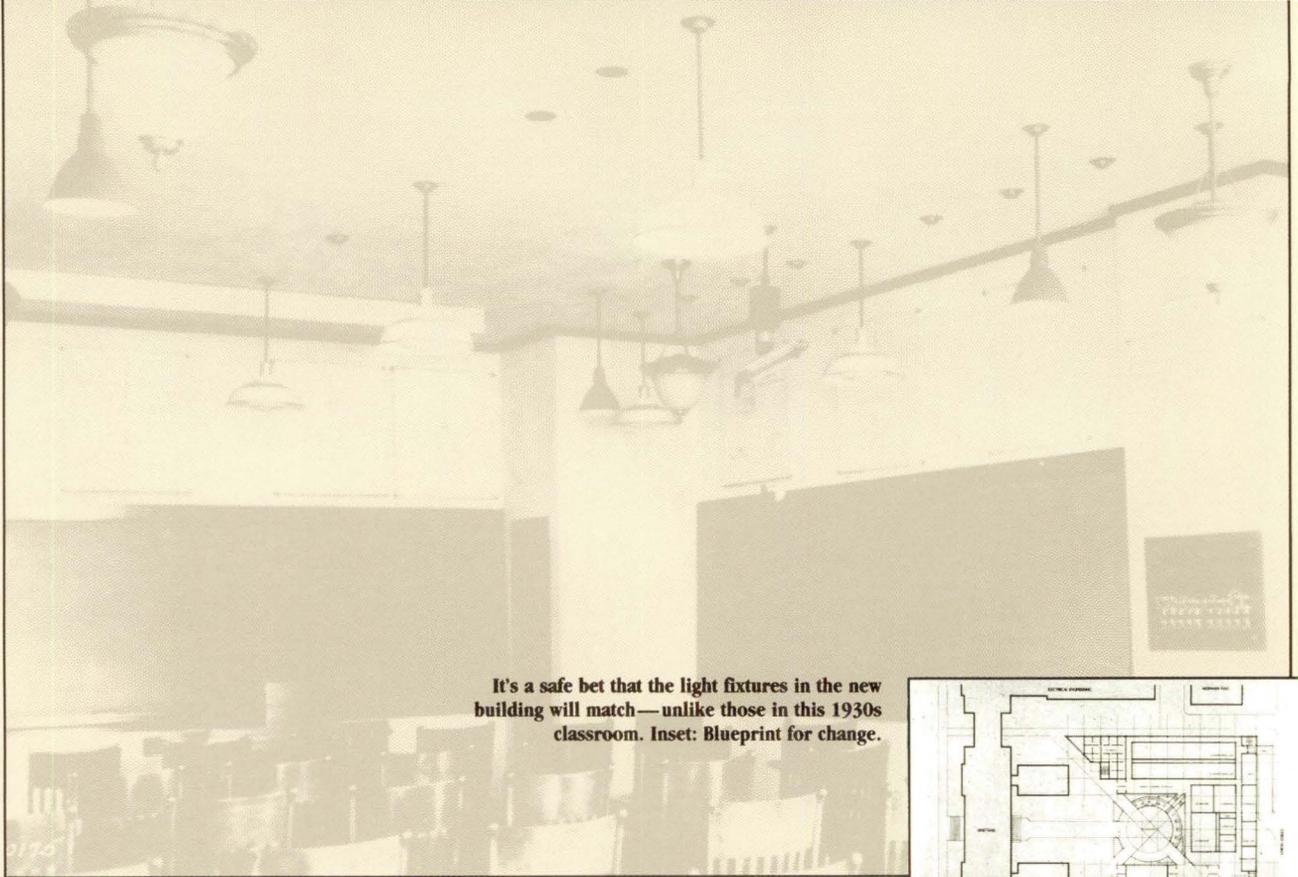
The electrical engineering program changed rapidly after the war. The department placed greater emphasis on graduate studies, and research and development began to blossom, according to Cartwright. One of the first big research projects required the building of a proton accelerator, similar to the particle accelerators used in applied physics research today. The project involved the physics and electrical engineering departments, with the electrical engineers focusing their efforts on generating the power needed to operate the accelerator.

Department members also began investigating the way oxide cathodes (the essential element in a vacuum tube) wore out through the release of electrons.

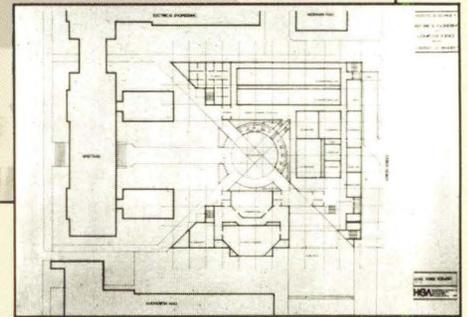
"That was one of the major thrusts of research in the world during the late 1940s and early '50s," says Robert Collins, current electrical engineering department head. "This department was one of the premier institutions doing research on oxide cathodes."

Their work led faculty to a closer analysis of the interactions that take place at the interface between the cathode and the vacuum space. "Part of that study was to see how atoms were arranged on the surface, to know what chemical impurities were present," Collins says.

The discoveries made by Minnesota researchers played an integral role in the



It's a safe bet that the light fixtures in the new building will match—unlike those in this 1930s classroom. Inset: Blueprint for change.



development of surface analysis techniques, which in turn were essential to the development of the semiconductor industry and solid state electronics, as well as to the magnetic film industry. Because of these and other research projects, the department achieved national prominence. In the early 1970s, Minnesota's electrical engineering department ranked among the top 10 in the country.

Adrift at sea

While the electrical engineering department enjoyed its newfound status, the computer science department was just getting its feet wet. Unlike electrical engineering, which began just eight years after Edison patented the incandescent lamp, the computer science department took its first shaky steps in 1971 in a community awash in computer technology. With the establishment of the state's first computer company, Engineering Research Associates Inc., in 1946, Minnesota had become a national leader in the computer and supercomputer industry.

"The technical development going on in industry in this community was way ahead of the computer science department in the early years," says Arthur L. Norberg, director of the Charles Babbage Institute for the History of Information Processing. "There wasn't much room for interaction between the business community and the University. The department wasn't big enough or cohesive enough, and it simply wasn't doing the kind of research industry was interested in."

Although the department wasn't formally established until 1971, the University began offering computer science graduate courses in the late 1960s through the mathematics department.

"The computer center [an offshoot of the mathematics department] started teaching informal courses in the late 1950s," says William Aspray, associate director of the Babbage Institute. "It was formed primarily to serve the scientific users on campus, and also business and management people."

It soon became clear that Minnesotans wanted and needed a separate program for computer science, according to Aspray. E. Bruce Lee served as interim department head until J. Ben Rosen arrived from the University of Wisconsin to become the first full-time department head. The new department set up its headquarters in Lind Hall.

"We were confronted with immediate space and equipment problems," Rosen says. "The interest far exceeded our ability to respond."

The first quarter, 12 faculty members taught 103 computer science students. Enrollment grew almost exponentially over the next several years, reaching a peak in excess of 1,700 students by the early 1980s. Although original plans called for expanding the faculty to 25 members in the first few years, persistent budget problems interfered, and class sizes ballooned.

Shortly after arriving at the University, Rosen turned to local industry for help in developing the new program.

"Local businesses played a very

important role," Rosen says. "Companies like Control Data, IBM, Univac, Cray Research, and Honeywell actively supported the department."

Rosen formed the Computer Science Associates group, an advisory board of representatives from local computer companies. This group met regularly with the department head and faculty members, supplying advice, program reviews, and financial support.

"Initially the department was highly theoretically oriented," Rosen says. "The advisory group encouraged us to become more involved in experimental computer science."

Despite the support and advice of local industry, the computer science department has yet to hit its stride. Space, salary limitations, and other problems have kept the department from reaching its potential, according to David Fox, current department head.

"The money we need hasn't been available the past several years," Fox says. "And space problems have made it difficult for us to bring in distinguished visiting professors. Class sizes are still too large, in spite of the tougher academic requirements for upper-division courses."

Nevertheless, the department has demonstrated solid improvement over the years, according to Fox. It has strong programs in the theory of computation, artificial intelligence, robotics, and

numerical analysis and optimization. Faculty size increased to 26 members and enrollment decreased, thus improving the faculty/student ratio. Fox is hopeful that the new building will provide the impetus to help the computer science department raise its stature.

A ship without sails?

The new Electrical Engineering and Computer Science Building is, as the saying goes, a real piece of work. No longer will the two departments be forced to cram a size 10 foot into a size 8 shoe. Classrooms and study areas should help increase student motivation. In addition, the building offers office space for visiting professors, meeting space for conferences, and enough laboratory space for all the departments' needs.

But there may be trouble in paradise. Equipment. For the new building to earn its flagship title, a significant infusion of dollars will be required to purchase new equipment.

"In the last 15 years, electrical engineering has fared badly," Collins says. "We've been gradually falling off a cliff, if that's possible." From the top 10 in the country, the department has slipped to "somewhere around 16th or 17th—maybe worse," according to Collins. There are problems with maintaining competitive faculty salaries and problems with class sizes, he says, but the number one problem is instructional equipment.

"The state of Minnesota and the University of Minnesota have not given us the resources we need to maintain our stature and provide a quality undergraduate education," Collins says. "Equipment problems in our undergraduate laboratories are a walking disaster.

"We've got a great faculty. They've won several awards recently. We hold the editorships of prestigious journals, and our research output in terms of dollars has doubled in the last three years. Now we've got a new building, but there won't be any equipment for it unless we can raise the funding."

Fox echoed Collins' sentiments.

"We have the lowest funding of any computer science department in the Big 10," Fox says. "To put us among the top public schools, something like \$7 million of additional instructional equipment will be required."

Much of the equipment used by the two departments is five to eight years old. After three years the equipment is obsolete according to industry standards, Fox says, although four years is the accepted figure for university use. In addition, annual maintenance of equipment requires from 5 to 10 percent of the original purchase price.

"The new building represents a

tremendous opportunity," Collins says. "The climate is ripe for change. The faculty in this department is looking forward to turning the program around."

The new building has opened the door to the future. Despite the equipment and other funding problems, both Collins and Fox are guardedly optimistic about the future. The electrical engineering department will celebrate its 100th birthday

in spring 1989. Computer science is still a teenager. If the equipment problems and other funding shortfalls can be corrected, both departments may find themselves in a position to step through that door and into the 21st century as leaders in their fields. **I**

Chuck Benda, former editor of Minnesota magazine, is a free-lance writer.

Photo by Patrick O'Leary



Inside the Emerald City

The walls are smooth and clean, the floors unscuffed. The faint smell of paint still lingers in the corridors. Although the laboratories aren't quite finished, most of the work on the new Electrical Engineering and Computer Science Building was completed by late summer, just in time for the faculty to move in for the start of fall quarter. After four and a half years of planning and construction, the two departments finally have a new home.

The \$44.3 million structure—completed on budget—contains more than 158,000 square feet of classrooms, offices, laboratories, and study areas, making it the largest academic building on campus. The first two levels of the six-level building are underground. The ceiling height of the first level is roughly the equivalent of two normal stories to allow for the sophisticated ductwork required for the laboratories located there, including four clean rooms that will be used by the Microelectronic and Information Sciences Center (MEIS).

First-level laboratories incorporate vibration isolation slabs—special concrete slabs designed to reduce minute vibrations that interfere with sensitive research projects. The slabs, built on concrete columns sunk to bedrock, are detached from the rest of the building. They performed so well in tests that the inspectors thought perhaps their equipment was malfunctioning since it detected almost no vibration.

The most striking architectural feature of the building, designed by Hammel, Green and Abrahamson Inc., is a central outdoor rotunda around which the U-shaped building is wrapped. The main entrance opens on a plaza at the corner of Union Street and Washington Avenue.

Beneath the rotunda, a bi-level student commons and study area takes advantage of the abundant natural light from the multitude of windows facing the rotunda.

The entire building is wired for state-of-the-art data communications, and classrooms are set up for sophisticated audiovisual systems, including data projection screens and closed-circuit television.

Overall, space in the new building will be roughly divided among users as follows: electrical engineering, 55 percent; computer science, 26 percent; classrooms, 9 percent; MEIS, 6 percent; student commons and study areas, 4 percent.

The finishing touches on the building should be completed by December. As part of the University celebration, "Homecoming: There's Just One 'U,'" alumni are invited to an open house for the building on Saturday, Oct. 8, from 9 a.m. to noon. The formal dedication of the building won't take place until spring 1989. **I**

By Chuck Benda

The Year of Guarded Optimism

Dean Ettore Infante talks about money, morale, and more

Interview

by Deane Morrison

Items: What would you identify as the most crucial issues IT will face in the coming year? How do you plan to deal with them?

Infante: It's always crucial that we perform our fundamental tasks better and better. Our fundamental tasks are teaching, research, doing scholarship the way it's supposed to be done, and being of service to our community. Given that circumstances have been less than felicitous in the last year, we will have to address even better than before some chronic problems in the Institute of Technology. The institute remains very stretched in all of its activities. We have too few faculty members for the number of students and research activities we're trying to sustain, and our facilities are not what they should be, whether for research or education. Our instructional equipment is of particular concern because it is not at all what it should be.

It is important to restore, in the minds of the faculty and students, the high level of expectations that we had and the determination that things will get better in the future. Certainly finances are an essential component, but not the only one. The morale of the faculty is also important. It takes money, but it takes more than just money.

Items: What are the financial prospects for IT in light of recent University events? What will be the availability of new resources? What will be the short- and long-term consequences of funding problems? What is IT doing to counteract concerns about finances?

Infante: In the coming year, IT must deal with the resources available in the University right now. Next year will be more or less like the past year. We have a tiny bit more money, but we have assumed certain financial responsibilities that used to be handled from the University's academic affairs office—for example, the Institute for Theoretical Physics and the Institute for Mathematics and its Applications. Certain new activities and new agreements have been made, especially as part of the Minnesota Campaign, such as the Center for the Development of Technological Leadership and some additional school funding for the Charles Babbage Institute. In particular, IT will have to assume obligations mandated by the Legislature to develop and deliver graduate programs at the master's level in electrical engineering, computer science, and technology management in the Rochester area.

Given the little extra bit of money and the very significantly increased obligations that we have, I think we'll be in worse condition than last year. For the short term, we're tightening our belts even more than last year. In the long term, I'm optimistic because I sense a certain amount of support. I think our University colleagues understand our situation. So do the executive and the legislative branches of our state government. I think IT has done extremely well in gathering research dollars from the outside in the last two or three years. I believe that when people see a good thing they will invest in it. IT is a very good thing, and I'm confident people will invest in it, which allows me not to be disturbed about events.

Items: Is IT keeping up with similar institutions? What kind of report card would it get? Which areas are leading or losing ground?

Infante: I think we're falling more and more behind in instrumentation. We have a great faculty who are becoming increasingly impatient. I worry that some of our very outstanding faculty members will decide that the grass looks greener on the other side and will accept the many offers they are receiving. I'm not talking only about faculty salaries. I'm talking about the overall environment. About having a balance in the number of students faculty members have so they can be satisfied in their teaching job instead of overwhelmed. Of having the instructional and research laboratories appropriate for faculty members. To have

libraries that support a scholarly community such as IT. In all of these arenas, things have not been very propitious. But the Minnesota Campaign has provided a big lift because it signifies the support of our friends, our alumni, and the industrial community.

We have departments that are absolutely outstanding, like chemical engineering, and the component of materials science in chemical engineering is now becoming a national center of activity. Mechanical engineering was always strong. My concern about mechanical engineering is, how long will it remain strong when it doesn't have the right equipment and instrumentation? Mathematics is an outstanding department, but all kinds of people and institutions are trying to raid it. Many of the foremost mathematics faculty will retire in the next five or 10 years and, frankly, we're not bringing in new blood. But overall, every area in IT—architecture, computer science, chemistry—has gone forward in the quality of the faculty. In the area of instrumentation, no.

Items: What is the status of equipment and facilities needs, including libraries?

Infante: We are \$30 million behind and falling further behind. We should spend between \$2.5 and \$3 million a year on instructional equipment. Next year we'll spend at most \$1 million. For example, a junior-year laboratory needs 30 wave analyzers, each costing \$20,000. Ours are about 15 years old. Five of them don't work. This summer two are being cannibalized to repair the others, and the six that do work are fit for a museum of science and not for an instructional laboratory. I have a note from students saying it's impossible for them to do their laboratory reports unless they find old reports to copy because they cannot get the data with their equipment. In computer science, the computers are out of whack. They cost a fortune to maintain and they're down too often. Newer models would work a lot better and be a heck of a lot cheaper. Chemistry has been begging forever to buy some equipment for their freshman and sophomore labs.

I'm more concerned about instructional equipment than research equipment because grants from federal agencies help with research equipment. But if the money for instructional equipment doesn't come from the University—that is, the state—we do not get it from anywhere.

In the case of Walter Library, cuts are threatened in acquisitions. The cost of acquisition has gone up about 25 percent, mostly because of the fall in the value of the dollar. The faculty strongly feels that the library should be buying more, not cutting back. Also, we must have our library air-conditioned and humidity controlled, or

our books will suffer very badly, not to mention the readers.

Items: So do you hope the next biennial request will include at least \$30 million extra?

Infante: I doubt it. That's too big a number. If somebody gave me \$30 million to overcome our equipment shortfall, I would say to them that to spend it well I would have to spend it over three or four years. And there are facilities, too. We're disappointed that no bonding bill passed the Legislature last year—which means no capital expenditures—because we desperately need to refurbish the old Electrical Engineering Building. The space there will be mostly for mechanical engineering, which really needs it.

We are \$30 million behind and falling further behind. We should spend between \$2.5 and \$3 million a year on instructional equipment. Next year we'll spend at most \$1 million.

Items: Does the new Electrical Engineering and Computer Science Building help?

Infante: Yes. It's on schedule and on budget, and we're very proud of that. In the fall we'll move in there. I wish we had some good equipment to put in it.

Items: What is the importance of federal and private funding? What plans might there be to increase money from those sources?

Infante: Over half the IT budget comes from federal and private sources. It's terribly important. We are as active as we can be in trying to obtain federal funds, mostly in grants to individual faculty and groups of faculty. And we have had a very successful capital campaign.

Items: Does IT support the idea of a central entry point for all freshmen, the Academy of Arts, Sciences, and Engineering? What is IT's role in the academy?

Infante: We have serious concerns about a single entry point. Our standards are much higher than the other collegiate units', and not just in math and science. Our average admission is about the 90th percentile of

graduates; in the others it's around the 70th. However, we have been assured that we should be able to continue the sort of management of enrollments that we need to do more harshly than the other freshmen-admitting colleges.

Items: How would IT or any other college operate as a unit if there's a common entry point? Couldn't everybody take your courses?

Infante: It has been suggested that everybody will be admitted, but immediately after there will be a question of admitting students to certain "tracks." One will be an IT track. But one must be careful that these devices don't in effect destroy the concept of a common entry point. We do not understand or even know the details that have been suggested for implementation. But we'll do our very best to see that whatever the University decides works in the best way. We'll work to our utmost to keep IT's instruction at its high level of reliability, responsibility, and quality.

Items: Do you support the idea that students entering degree programs shall have certain levels of preparation in academic subjects, which not all high school graduates entering the University now have?

Infante: I support the standards, with students having the opportunity to make them up on a non-credit basis. If they want to get into a degree program, they need those credits. Otherwise, they will not have the educational preparation they need to live in the 21st century.

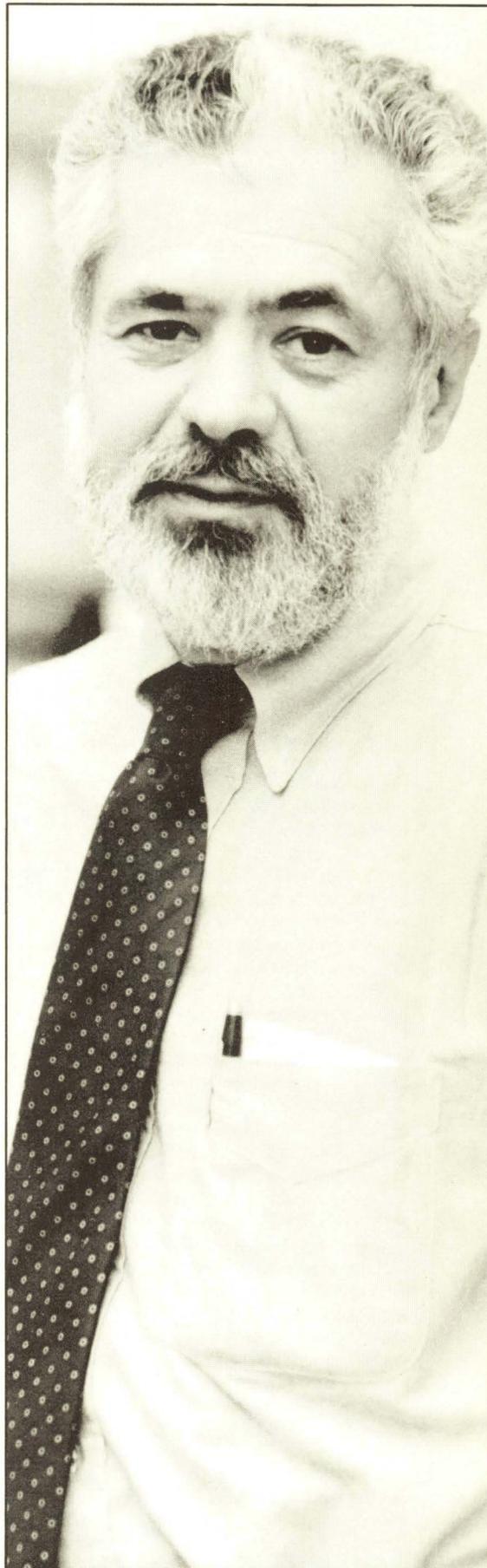
Items: How is faculty and staff morale?

Infante: It could be a lot better. This has been a harsh year for the University. Every time one opens a local newspaper, somebody is bashing the University. It's not designed to support morale. But we in IT remain determined to really do our job well. The next year will be critical. I have been here for four years, and only two or three IT faculty members who I would not have wanted to see leave have left. That's an unusual record of retaining faculty.

Perhaps I'm an incurable optimist, but I do not think so. I'm convinced that the people of Minnesota want this institution to be responsive to their needs, intellectual and otherwise, and will support it well. We at IT know we're good. We want to be better. And we're determined to do it. I believe Minnesotans share our determination. **I**

Deane Morrison covers science and technology issues for the University News Service.

Photo by Patrick O'Leary



Ettore Infante, IT dean

The Campaign Trail

A whistle-stop tour of new ventures gained via the vision of IT supporters

Stories by Rabun Taylor

After more than three years of intense fund raising and unparalleled success, the Minnesota Campaign is history. By the cutoff date of June 30, 1988, the University had received well over the targeted \$300 million in gifts from private donors. Many of these gifts—most notably, endowments for chairs and professorships—have been matched by the Permanent University Fund, a multimillion-dollar portfolio released by the state Legislature in 1985.

IT raised \$60.7 million in gifts over the past three and a half years, according to Robert V. Hanle, IT's director of external relations. Of this total, IT will benefit from \$30.5 million in endowments for academic positions and an additional \$1.8 million in endowments for scholarships and academic program support. The remaining \$28.4 million was raised for continuing academic program support, including undergraduate and graduate student assistance, instructional equipment, and facilities, as

well as private research grants and contracts. On average, about 5,200 individuals and 650 corporations/foundations contributed to IT each year of the campaign.

These pages offer a sampling of the gifts IT has received over the past two years. They reflect not just variety, but a real vision and commitment on the part of givers and recipients alike.

Illustrations by Dick Flor



Cosmic Creativity

The Institute for Theoretical Physics

Ironically, theoretical physics is an intensely human occupation. Equipment and technology simply aren't suitable for predicting its strange twists of logic and unexpected revelations about the natural world. Only the human faculties of spontaneity, creativity, and dialogue will do—and the more minds involved, the better.

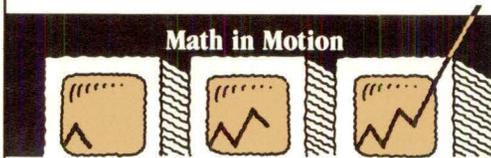
The University's new Institute for Theoretical Physics brings physicists together in just such an atmosphere of creative give-and-take. It owes its existence to William Fine, a Minneapolis real estate developer with a passion for physics. Besides contributing and raising \$2 million to launch the institute, Fine is helping to define its mission and to fill its two endowed chairs with top scientists.

The institute has already made a difference through its workshops. For instance, in October 1987, it hosted a workshop on high-temperature superconductivity. "We had a publisher put out the proceedings on that one because it's such a hot subject," says acting director Stephen Gasiorowicz.

Other workshops in 1987-88 covered topics in high-energy physics, astrophysics, computation, quantum devices, and a newly discovered phenomenon called the Berry Phase.

This September the institute hosts the Eighth International Symposium on High-

Energy Spin Physics, which will feature some of the world's best physicists. For a unit that is seeking a Nobel-caliber director, a little good publicity couldn't hurt.



Math in Motion

The IBM-Woksape Grant in Mathematics

In 1985, an IBM-Woksape grant offered free IBM microcomputers and software to any department at the University that could come up with an imaginative use for them. Dozens of departments took advantage of the grant, including several in IT.

The School of Mathematics alone received resources for three projects: a combinatorics lab (combinatorics is the study of combinations and permutations), a program of enrichment courses for high school math teachers, and a system that turns computer models into graphics. In this third project, researchers program mathematical models, or even apparently random models, into microcomputers to form moving pictures on the screen. They watch for interesting patterns in the pictures, which may indicate the workings of unknown mathematical formulas. By reviewing the data that correspond to such patterns, researchers can often construct the formulas underlying them.

"Everybody knew that things fall when you drop them, but until Newton came along with some mathematical formulas to describe it, no one could get any further than that—it was just empirical data," says

mathematics professor Laurence Gray. "That's kind of the game we're playing: you observe the phenomenon and then you try to come up with some mathematical explanations for it that you can work out without having to take data all the time. One formula is worth reams of data."



Safety First

The James J. Ryan Alumni Distinguished Professorship in Mechanical Engineering and the Richard K. and Barbara L. Nelson Land-Grant Chair in Mechanical Engineering

James "Crash" Ryan literally ran into walls for a living. A mechanical engineering professor at the University from 1931 to 1973, he became legendary for demonstrating his auto safety inventions in crash tests—with himself as the crash dummy. During a long and productive career—in which, incidentally, he managed to avoid injury—he invented scores of safety devices, including the modern seat belt and the "black box" flight recorder.

A passionate advocate of auto safety legislation, Ryan often made his point with a demonstration. Wearing a lab coat and a Golden Gophers football helmet, surrounded by students and reporters, he would hurtle his hydraulic-bumpered test car against a concrete wall and emerge to thunderous applause. His parallel demonstrations with ordinary cars and crash dummies would leave the cars in ruins.

Amid all the theatrics he managed to teach about 10,000 students with passion and humor, inspiring many to pursue careers in mechanical engineering. In his honor, an alumnus who wishes to remain anonymous has created the James J. Ryan Alumni Distinguished Professorship in Mechanical Engineering. A fixed-term position for senior faculty, it encourages special and diverse contributions to research.

Among the many students Ryan touched is Richard Nelson (Mechanical 1952, M.S. 1953). But while Ryan destroyed automobiles, Nelson likes to preserve them: he owns several antique cars. Nelson develops software for Cray Research, where he has been a distinguished engineer since the company's early days. In 1986, he and his wife Barbara endowed the Richard K. and Barbara L. Nelson Land-Grant Chair in Mechanical Engineering, a rotating appointment for senior professors. The chair's first occupant will probably be a specialist in robotics; but after the first year, anything goes. "It's a tool to bring in people in specialty areas," says Nelson.



The George T. Piercy Distinguished Visiting Professorship in Chemical Engineering and Materials Science

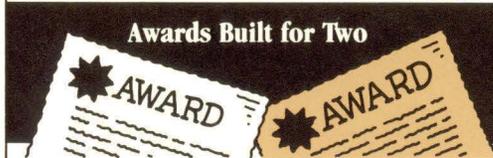
Thanks to a distinguished visiting professorship made possible by alumnus George T. Piercy, the Department of Chemical Engineering and Materials Science, which often loans out its own talent, is now borrowing some for itself.

This year the \$250,000 endowment will sponsor visits by two eminent professors. Håkan Wennerström of the University of Lund, Sweden, will bring expertise on nuclear magnetic relaxation and self-assembling systems. And Doraiswami Ramkrishna of Purdue will deliver a special lecture series on topics in biochemical engineering.

Ramkrishna received his doctorate at Minnesota in 1965. The unusually cooperative atmosphere at that time between the mathematics and engineering departments, which he credits with fostering "a unique mathematical culture among the engineering students and faculty," led Ramkrishna to acquire a special interest in the application of mathematics to engineering. With fellow Minnesota graduate Neal Amundson, he wrote a textbook on linear operator methods in chemical engineering.

Piercy (Chemical 1938), a retired senior vice president of Exxon, has been heavily involved in the University

Foundation and the Minnesota Campaign. He received an Outstanding Achievement Award, the University's highest award for an alumnus, in 1979.

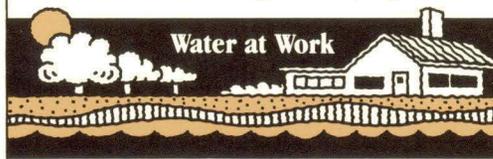


The Bonestroo, Rosene, Anderlik and Associates Undergraduate Scholarship and Faculty Award Endowment

University of Minnesota graduates Otto Bonestroo and Bob Rosene, along with partner Joseph Anderlik, added a new twist to their long-standing support of civil and mineral engineering scholarships.

This year, the engineering consulting firm of Bonestroo, Rosene, Anderlik and Associates will help students and reward those responsible for teaching students. Half of the income from their \$60,000 endowment will be awarded yearly to a faculty member who has shown outstanding commitment to undergraduate education, while the other half will go as a scholarship to a deserving undergraduate. Professor Roberto Leon, noted for his studies of earthquake stress on concrete, received the first faculty award in May.

"We feel that many professors are under pressure to expend all their extra effort on graduate programs and on the 'publish-or-perish' syndrome—and that, in effect, they are penalized by the time that they spend with undergraduates," says Bob Rosene. "We feel that's a mistake, because most graduates coming from the University are getting bachelor's degrees. Professors should be encouraged to devote extra time and effort to the undergraduate program."



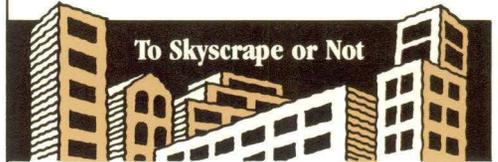
The George and Orpha Gibson Chair in Hydrogeology

Water is much in the public mind these days. News of drought, chemical leakage, and other environmental problems raises important social and scientific questions. How does the water supply affect us, and how do we affect it?

Hydrogeologists work to find answers to these questions. "Hydrogeology is basically concerned with the water below the earth's surface," says Peter Hudleston, head of the Department of Geology and Geophysics. "It's concerned with the mechanics of groundwater in the earth and the water's chemistry—its reaction with the rocks of the earth that it's moving through." Applications of hydrogeologic research

increase our ability to predict water movement and make wise decisions about water regulation and land development and conservation.

George Gibson (Geology 1930, Ph.D. 1932) and his wife Orpha have donated \$1 million for a chair in hydrogeology, which will strengthen an already strong program at Minnesota. "The University is located in a state from which flow the headwaters of three important watersheds: the St. Lawrence into the Atlantic; the Mississippi River into the Gulf of Mexico; and the border lakes into the Hudson Bay," says George Gibson. "It is the logical geographical location for hydrogeological studies."



The Center for Urban Design

Save the Orpheum. Ban the garbage incinerator. Put a roof on the Nicollet Mall. Up with the new convention center, down with Memorial Stadium. Deflate the Metrodome. Bring your business to the World Trade Center, and your dollars to the Megamall.

As people who care about their community, Minnesotans debate proposals for urban development with gusto. But for all our attention to the politics of space, sometimes the bigger picture falls through the net of our scrutiny. To what larger strategy does each project belong? When all the new projects are seen together, is the whole greater than the sum of the parts?

In 1986, the School of Architecture and Landscape Architecture proposed a center at the University that could address these questions within a broad regional context. The center will study and help to resolve development problems facing the Twin Cities and other urban centers in the Upper Midwest. "Learning from this city's scale and from its climate will be part of what the center is about," says architecture professor Dale Mulfinger.

The Dayton Hudson Foundation was so enthusiastic about the proposal that it gave the University \$2.3 million for the project—twice the amount proposed.

In June, the new Center for Urban Design named its first director: William Morrish, a well-known California architect and urban designer. Educated at Berkeley and Harvard, he has gained worldwide recognition as a specialist in regional design. "I think a dynamic center will arise from his tenure," says Mulfinger. **I**

Rabun Taylor is an editor in University Relations.

Science and Technology Day

October 4, 1988

**Institute of Technology Alumni Society
University of Minnesota
Annual Meeting and Evening Banquet**

The Atrium at International Market Square
Minneapolis, Minnesota

Keynote Speaker:

John Sculley

Chairman and CEO
Apple Computer, Inc.
Cupertino, California

Reserve a table now! Call Cynthia Killmer at (612) 624-1030.

ITAS wishes to thank the following organizations for their support of Science and Technology Day 1987:

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Anthony Falls Hydraulic Lab/U of M ■ St. Paul Fire & Marine
■ Sun Microsystems Inc. ■ Tech Trade Communication ■ Tunks
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Semiconductor Operations

Noted

Don Birmingham, director of IT's Project Technology Power, and Russell Hobbie, IT associate dean, received 1988 Gordon L. Starr Awards from the Minnesota Student Association in recognition of their efforts toward creating a better student environment. ■ Nicolaas Bloembergen, 1981 Nobel Prize winner and Harvard University's Gerhard Gade University Professor, delivered the seventh Abigail and John Van Vleck Lecture in May. ■ Mostafa Amir El-Sayed, professor of chemistry and biochemistry at the University of California, Los Angeles, was the speaker for the 1988 spring quarter Kolthoff Lectureship in Chemistry. ■ The Plumb Bob Honorary Society sponsored IT Week 1988 in May. Held in conjunction with IT Week, the fourth annual Microcomputer Fair and Technology Fair attracted representatives and displays from 23 high-technology companies. ■ The Minnesota Supercomputer Institute will host a workshop on practical iterative methods for large-scale computations Oct. 23-25. ■ The School of Architecture and Landscape Architecture celebrated its 75th



anniversary with a Diamond Jubilee in May. ■ The St. Anthony Falls Hydraulic Laboratory (SAFHL) will celebrate its 50th anniversary Sept. 22-23. ■ Ekaterini I. Daniil-Margariti, a Ph.D. candidate in civil engineering at the University, received SAFHL's 1988 Alvin G. Anderson Award in April. ■ *Items* won a 1988 Northern Lights Award of Merit in the external newsletter category from the Minnesota Association of Government Communicators. I

ALUMNI

1927

Hans A. Norberg (*Electrical*) is the founder and president of Norberg Industries Inc., Tulsa, Okla., a manufacturer of high-voltage fuses and accessories.

1949

Richard E. Ward (*Civil and Mineral*), formerly an officer and partner of Construction Management Services Inc., Minneapolis, retired in December 1987 and now lives in Arizona.

1956

Willis G. Schoemaker (*Agricultural*) is the president of Willis Construction Co., a builder of custom homes for 28 years.

1960

B. Hubert Pinckaers (*Electrical*), president and principal consultant of Pinckaers Engineering Inc., Bloomington, Minn., was inducted into the Minnesota Inventors Hall of Fame in 1987. A holder of 78 patents, he is listed in *American Men of Science* and *Who's Who in Technology Today*.

1970

Stephen J. Davidson (*Physics*), a partner in the Minneapolis law firm of Leonard, Street and Deinard, was elected to the Computer Law Association's board of directors in March. He is the first Minnesota lawyer elected to the board of the association, an international organization founded to educate lawyers in the legal considerations of computer technology. Davidson also was elected chair of the Minnesota State Bar Association's computer law section.

1972

Michael Overcash (*Chemical, Ph.D.*), professor of chemical engineering at North Carolina State University, is a member of a new National Academy of

Science committee focusing on chemical releases, waste minimization, and toxic management.

1973

Brian J. Pashina (*Civil and Mineral*) is a partner and vice president of Engineering Evaluations Inc., Eden Prairie, Minn., a civil engineering consulting firm specializing in structural failure investigations and construction and building problem solving.

1975

Janice R. (Tjebben) Durnil (*Chemical*), a business consultant, is self-employed in the business she started three years ago. She has been married to her husband, Jerry, for 11 years.

1976

Michael W. Deuteran (*Mechanical*) is manager of engineering support for EG&G Automotive Research Inc., San Antonio, Texas.

1980

Bradford G. Orr (*Physics, M.S.; 1985 Ph.D.*), assistant professor of physics at the University of Michigan, received a Presidential Young Investigator Award from the National Science Foundation. He was also awarded an Alfred P. Sloan Foundation Research Fellowship.

1981

Allan S. Klugman (*Civil and Mineral*) joined Howard Needles Tammen & Bergendoff, Minneapolis, as senior transportation/traffic engineer in the recently established planning/research department. He is involved in the department's marketing, promotion, and transportation planning and engineering.

1982

Wendy (Marti) McDonald (*Electrical*) is a patent,

copyright, and trademark attorney at Merchant and Gould, a Minneapolis law firm.

Stephen G. Theissen (*Electrical*) received his M.S. in engineering administration in 1986 from St. Mary's University, San Antonio, Texas, and is currently manager of Tempest Engineering in the EMC/Tempest division of Science Applications International Corp., San Diego, Calif. He and his wife, Susan, have two children.

1983

Michael Beaupre (*Civil and Mineral, 1986 Computer*) is the founder and president of Professional Custom Software, Minneapolis, a scientific programming and systems analysis firm.

1985

Steven M. Hintzke (*Aerospace*) was recently promoted to engineering supervisor of Irvin Industries Inc., Santa Ana, Calif., a leading developer of parachute and recovery systems.

1987

Jim Parkes (*Mechanical*) is an operations/test engineer for Sverdrup Technology, Cleveland, Ohio, where he is involved in aerospace propulsion technology. He also is working on an M.S. degree in mechanical engineering at Cleveland State University.

1988

Ralph D. Knox (*Physics, Ph.D.*) is an associate scientist at Iowa State University of Science and Technology, Ames, Iowa. He is currently working on a joint Iowa State University/3M amorphous semiconductor program. I

ALUMNI NEWS



OUTSTANDING ACHIEVEMENT AWARD

Coming in October: the class of '38 reunites

The Institute of Technology 50th reunion, for the class of 1938, will coincide with the University's fall homecoming celebration.

Fiftieth reunion festivities will be highlighted by the reunion reception and dinner at 6 p.m. Wednesday, Oct. 5, at the Radisson University Hotel, 615 Washington Ave. S.E., and by departmental open houses on Friday, Oct. 7.

The University-wide celebration, "Homecoming: There's Just One 'U,'" will kick off on Sunday, Oct. 2 and conclude on Saturday, Oct. 8. An open house for the new Electrical Engineering and Computer Science Building will be held on Saturday, Oct. 8, from 9 a.m. to noon. All alumni are welcome to attend. For more information, call IT External Relations at 612/624-1030. **I**

Two outstanding alumni honored

Lloyd A. Duscha (Civil and Mineral 1945) and John E. Franz (Chemistry 1955 Ph.D.) each received an Outstanding Achievement Award (OAA) at the June 3 Institute of Technology graduation ceremony. The highest honor conferred on University alumni, OAAs recognize unusual distinction in the recipient's field.

Duscha, as deputy director of engineering and construction for the U.S. Army Corps of Engineers, is the top-ranking civilian in the corps. A Minnesota native, he was elected to the National Academy of Engineering in 1987 and is an advisor to the Chinese government on what will be the world's largest dam.

Franz, a distinguished fellow of Monsanto Co., is best known for developing Roundup® herbicide. He holds more than 600 patents and has received numerous awards,

including the St. Louis Metropolitan Bar Association's Inventor of the Year Award and a national medal for excellence in science and technology conferred by President Ronald Reagan. **I**

New directors join ITAS board

The following Institute of Technology Alumni Society (ITAS) members agreed to serve on the 1988-89 ITAS board of directors: **Jack Brill** (*Chemical 1961*), vice president, engineering, Ecolab Inc., Eagan, Minn.; **Kent Maffitt** (*Physics, 1964 M.S.*), manager, Thin Film Media Division of Control Data Corp., Minneapolis; **Brian Pashina** (*Civil and Mineral 1973*), vice president of Engineering Evaluations Inc., Eden Prairie, Minn.; **Keith Sjoquist** (*Architecture 1965*) of Station 19 Architects Inc., Minneapolis. **I**

Noted

The civil and mineral engineering department presented its 1987-88 Simon and Claire Benson Award to Kimberly M. Mitzel and Peter J. Torkelson. ■ ITAS has awarded three \$2,000 scholarships, the first in a new program funded by a recent endowment from the estate of Mary G. Childs (wife of Morris Childs, Electrical 1925). The 1988-89 recipients of the scholarship, awarded to undergraduate children of alumni for academic merit, are: Lee Gordon (junior, computer science), Christopher Huber (junior, mechanical), and Neal Sanger (senior, electrical). **I**

Call him "doctor"

Earl E. Bakken (Electrical 1948) received an honorary doctor of science degree from the University's Medical School at the school's June 3 commencement.

Bakken is the co-founder and senior board chair of Medtronic, the world's first cardiac pacemaker manufacturer, and is board chair of the Minnesota Medical Alley Association, a consortium of corporations and institutions dedicated to developing health care technology in Minnesota. He also established the Bakken Museum of Electricity in Life in Minneapolis. In 1981, Bakken received the University's Outstanding Achievement Award. **I**

FACULTY

Aerospace Engineering and Mechanics

Professor **Jerald Ericksen** received an honorary D.Sc. from Heriot-Watt University, Edinburgh, Scotland. Professor **Roger Fosdick** spent spring quarter 1987 as a visiting professor at the Università di Pisa, Italy. Professor **Phillip Hodge** received an Euler Medal from the U.S.S.R. Academy of

Sciences for distinction in mechanics. He is assistant treasurer of the International Union of Theoretical and Applied Mechanics, and is secretary of the U.S. National Committee on Theoretical and Applied Mechanics. **Perry H. Leo**, assistant professor, joined the department fall quarter 1988. Professor **Robert Plunkett** retired in June.

Agricultural Engineering

Jonathan Chaplin, assistant professor, was named a chartered engineer by the United Kingdom's Engineering Council. Professor **Roger E. Machmeier** retired in July. Professor **Vance Morey** and two colleagues won a 1988 American Society of Agricultural Engineers Paper Award. The Future Farmers of

America (FFA) awarded an Honorary State Farmer Degree to professor **Cletus Schertz** in April for his promotion of FFA activities.

Architecture

Professor **Dennis Grebner** was elected a fellow of the American Institute of Architects. **Garth Rockcastle** and **Julia Robinson**, associate

Faculty to p. 16

What do over 4,000 IT grads know that you don't?

That supporting the University of Minnesota Institute of Technology is more important than ever. And it's easy!

When you join the Minnesota Alumni Association you automatically become a member of the Institute of Technology Alumni Society (ITAS). No extra forms to fill out. No extra fees.

*Join the 4,000-plus IT grads who already have taken advantage of MAA membership. Their support contributes to Science and Technology Day; the annual Cartwright Outstanding Student Award; **IT CONNECTION**, the student newsletter; even this issue of **ITEMS**.*

*What's in it for you? Six bimonthly issues of **MINNESOTA** magazine. Free access to all Twin Cities University libraries. Discounts at the University Golf Course and Outdoor Store. And more.*

*Isn't it time you demonstrated your support for the highest possible standard of scientific and technical education? Join ITAS today. Just fill out this form and mail it to the MAA. And, **PLEASE** give us a call if you'd like to help out with ITAS activities and events. We need **YOU** to be involved!*

 Cheryl M. Jones

Kris Black
President
ITAS

Cheryl Jones
Program Director
MN Alumni Assoc.

INSTITUTE OF TECHNOLOGY MINNESOTA ALUMNI ASSOCIATION

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professors, were awarded 1988-89 Bush Sabbaticals by the University.

Chemical Engineering and Materials Science

Regents' professor *Rutherford Aris* was elected a fellow of the American Academy of Arts and Sciences in May. *H. Ted Davis*, professor and department head, was the 1988 Donald L. Katz Lecturer in Chemical Engineering at the University of Michigan. *Jeff Derby*, assistant professor, joined the department fall quarter 1988. Visiting professor *Yoseph Katz*, of Beersheba, Israel, joined the department in June. *Alon McCormick*, assistant professor, joined the department fall quarter 1988.

Chemistry

Professor *Paul Gassman* was appointed a regents' professor, the University's highest honor for faculty, by the University's board of regents in June. Professor emeritus *Izaak M. Koltzoff* was awarded an honorary membership in the Society for the Analytical Chemists of Pittsburgh. Professor *Doreen Leopold* was the only University faculty member to receive a 1988 Presidential Young Investigator Award.

Civil and Mineral Engineering

Gov. Rudy Perpich appointed *Roger E.A. Arndt*, professor and director of the St. Anthony Falls Hydraulic Laboratory (SAFHL), to the Governor's Blue Ribbon Commission on Cold Weather Research. Professor *Steven L. Crouch* was appointed the department head. Professor *César Farell* of SAFHL received the Distinguished Senior

Scientist Award from the Alexander von Humboldt Foundation, Federal Republic of Germany. Professor *Laurence Goodman* retired in June. Professor *Walter Maier* will spend his 1988-89 sabbatical as a visiting fellow in Princeton University's water resources program. *Kenneth J. Reid*, professor and director of the Mineral Resources Research Center (MRRC), is a member of the advisory committee for the University of California mineral engineering program at Berkeley. Visiting professor *Marian Stachowicz* of the Technical University of Cracow, Poland, is spending 16 months at MRRC. *Ray Sterling*, associate professor and director of the Underground Space Center, was appointed the initial holder of the Shimizu Professorship in Civil and Mineral Engineering, which will fund his underground space utilization technology research for a five-year term. Sterling is also on the advisory board for the Whole Building Systems Integration Laboratory feasibility study, sponsored by the U.S. Department of Energy.

Electrical Engineering

Bernard V. Haxby, professor and associate department head, and professor *Allen Nussbaum* retired in June.

Geology and Geophysics

Regents' professor *Herbert Wright* retired in June.

Mechanical Engineering

Regents' professor emeritus *Ernest R. Eckert* was an American Society of Mechanical Engineers Distinguished Lecturer. *Richard J. Goldstein*,

professor and department head, received the 1988 George Taylor Distinguished Service Award. Professor *Warren E. Ibele* received the George Taylor/IT Alumni Society Distinguished Teaching Award. *Peter H. McMurry*, associate professor, has been awarded a Fulbright grant to study atmospheric aerosols at the University of Kuopio, Finland.

Physics and Astronomy

Ronald Chaldu, assistant professor at the State University of New York College at Oswego, will spend his 1988-89 sabbatical in the astronomy department. *John M. Dickey*, associate professor, was awarded a 1988-89 Bush Sabbatical by the University.

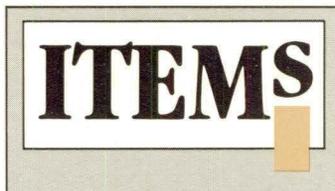
Professor emeritus *George D. Freier*, who specializes in atmospheric physics, published a book, *Weather Proverbs*, in June. Professor *Phyllis Freier* received a 1988 Horace T. Morse-Minnesota Alumni Association Award for Outstanding Contributions to Undergraduate Education. *Barbara Jones*, associate professor at the University of California, San Diego, has joined the astronomy department for a year under the National Science Foundation's Visiting Professorships for Women Program. Professor *Homer T. Mantis* retired in June. Professor *Keith Olive* received the 1988 George Taylor Distinguished Research Award. I

DEATHS

Abraham S. Berman, 66, professor of aerospace engineering and mechanics at the University for 22 years and director of undergraduate education for the department. Known as an approachable and caring teacher, he received the University's Horace T. Morse-Amoco Foundation Award for Outstanding Contributions to Undergraduate Education in 1979. The IT Student Board named him Outstanding Teacher of the Year in 1977 and again in 1986.

Lawrence E. Conroy, 61, associate professor of chemistry. A faculty member of the University's chemistry department for 29 years, he taught many levels of chemistry courses and helped develop science education in the state. He also was a dedicated environmentalist, studying water quality and treatment methods.

Fred G. Peterson (*Civil and Mineral, 1927*), a civil engineer involved with heavy construction throughout his career. I



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