

By George Lausch

Van der Ziel honored for teaching

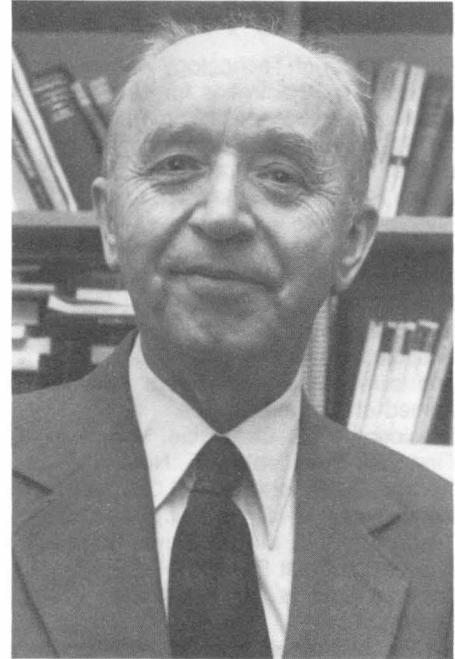
"A gifted teacher who demonstrates a compassionate understanding for the human aspects of teaching technical material to young people," according to his department head E. B Lee, has been awarded the 1980 Education Medal by the Institute of Electrical and Electronics Engineers (IEEE). Aldert van der Ziel, professor of Electrical Engineering, is being honored with an award that is presented annually to only one of the more than 200,000 members of IEEE for "outstanding contributions to education."

The award, which consists of a gold medal, a bronze replica, and a certificate, will be presented on Sunday, May 11, in Boston, Massachusetts, during the week of IEEE's ELECTRO conference. The medal will be engraved with the citation: "For leadership in engineering education, and for contributions to noise theory in electronic devices."

Dr. van der Ziel, a University of Minnesota professor since 1950, was born in 1910 in Zandweer, the Netherlands. He studied physics at the University of Groningen, obtaining his PhD in 1934. He then became a member of the Philips Research Laboratories, Eindhoven, the Netherlands, where he and an associate initiated a program of research on the noise properties of vacuum tubes.

In the course of his research, van der Ziel made a number of discoveries which eventually led to a total of more than 15 patents granted by the Dutch and United States governments. His inventions include the feedback circuit that compensated for partition noise in UHF pentodes, an essential component in the early days of telecommunications; and the microwave parametric upconverter, an aid to the development of the fields of radio astronomy, space exploration, and satellite communications.

Professor van der Ziel's teaching career began in 1947 at the University of British Columbia, where he served as an associate professor of physics until his appointment to the University of Minnesota. He has since taught courses in noise, physical electronics, electrical and electronic circuits, and electronic devices. Although he has taught a number of undergraduate courses, his main emphasis has been



Aldert van der Ziel

on graduating Masters and PhD candidates. He is presently working with his 59th doctoral candidate.

He sees himself as the student's mentor, believing "in giving the student an opportunity to prove himself.

"I do not sit in my Ivory Tower and not interact with the students," says van der Ziel. "I try to interact with them as much as possible, to steer them in the right direction and help them with their difficulties."

Many of his masters and Ph.D. candidates were students in his undergraduate classes as well. And, though his former students have spread out around the world, van der Ziel still remains in touch with many of them, and even joins with them in research projects or collaborates with them in writing technical papers.

Van der Ziel's enthusiasm for education is equally evident in his writing projects. In addition to the nearly 400 technical papers to his credit, he has authored several graduate texts that are considered by his colleagues to be classics in the field. The two books *Noise* and *Solid State Physical Electronics* have marked him as a major authority in these fields. His books are a "work of love" according to van der Ziel. "I like to (turn to page 3)

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JOIN & SUPPORT IT!

IT alumni, professional colleagues, and University friends are attending special RITA luncheons in the Twin Cities area this spring to find out about all the excitement in IT. Join them on May 21st. Reservations at (612) 373-2466.



Volume 6 Number 1
Spring 1980

A Report from the IT Alumni President

The Institute of Technology Alumni Society (ITAS) activities for 1979-80 received a tremendous boost from 1979's Science and Technology Day held in late October at the Radisson South Hotel in Bloomington. Over 900 people—setting a new record—attended the evening banquet to hear Astronaut Donald (Deke) Slayton, a University of Minnesota graduate, talk about the National Aeronautical and Space Association's Space Shuttle program, and to meet the new officers. Officers named at that event were: President—G.A. Champine, Vydec, Inc., First Vice President—L.E. Nelson, 3M; Second Vice President—R.C. Heinselman, Sperry Univac; Secretary-Treasurer—J.E. Meyer, Meyer Borgman & Johnson; Past President—A.F. Yapel, 3M; and Student Representative—Jose Lopez.

The first meeting of the ITAS Board of Directors was held in mid-December at the Normandy Hotel in Minneapolis. Members of the IT faculty and the Dean's staff were invited to meet board members and to exchange ideas. The new board members were also introduced and include: Jack Braun of Braun Engineering, representing Civil & Mineral Engineering; Ev Dale of McQuay-Perfex, as member-at-large; Norman Silver of Silver, Morken Associates, as member-at-large; Donald Sudor of IBM, representing Computer Science; Greg Vandersteeg of 3M, representing Chemistry; and Roland Weber of Physical Electronics, representing Electrical Engineering. Also, at this meeting, we presented and discussed the goals and objectives of the IT Alumni Society.

ITAS serves five constituencies—the IT alumni, the Institute of Technology, the IT students, the business community, and society at large.

The IT alumni are served in many ways, including through the annual Science and Technology Day. As a major activity, this updates alumni on current technological events and provides a forum for them to meet fellow alumni, professional associates, the IT faculty, and technology leaders from around the world. ITAS also



George A. Champine

sponsors luncheon seminars on topics of current interest. Last year's seminars, which addressed "Surviving Company Politics," were well-attended. This year's proposed topic is "Personal Finance Management during High Inflation."

The alumni have helped IT in its pursuit of excellence in numerous ways. With our assistance, several departments established departmental advisory groups made up of technology leaders in their respective disciplines. These advisory groups promote communication between the department and the business/ government world. The benefits work both ways—describing the capabilities, goals, and needs of the technical community to the department, as well as those of the departments to the community. Tangible benefits have been realized in the forms of equipment gifts and funding to specific departments. ITAS has also established an annual award for an outstanding IT teacher, last year honoring Professor Warren Loud of the Mathematics department.

Annually the Alumni Society sponsors several projects to help students, including a series of career orientation lectures during E-Week. In 1980 these lectures will be expanded. Merit scholarships are also awarded to students, with \$1,000 going to a top male and a female student in the competition. In addition, ITAS administers a referral service for students seeking specific information

about science and technology careers. The service connects students with appropriate professionals who can answer their questions.

The business community benefits from ITAS activities through the high quality graduates and extensive resources available from IT. Finally, society-at-large benefits from the quality services and products relevant to its needs which are produced by IT graduates and science and technology industries.

The IT Alumni Society is one of the most active and, perhaps, the most successful of all constituent societies within the parent organization, the University of Minnesota Alumni Association.

ITAS is planning bigger and better projects in 1980. The date for this fall's Science and Technology Day, which will focus on productivity, is November 7.

R.C. Heinselman headed the 1980 event until a professional transfer took him to California. Now John E. Meyer is completing arrangements. Dave Hagford will handle publicity and Ev Dale, patron table solicitation.

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Editor's Note: ITems will appear in a new format for its 1980 Summer issues. Watch for the alumni publication as a tabloid soon.

ITEMS

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Russ's transfer also meant a change in our executive committee. John has replaced Russ as second vice president, and Joseph R. Schumi of St. Paul Fire & Marine is now ITAS secretary-treasurer.

The Mechanical Engineering department is celebrating its 100th Anniversary this year, and its activities will be incorporated into Science & Technology Day.

Although ITAS programs and activities have steadily gained momentum over the last decade, our membership has remained relatively constant at 10% of a total 22,000 Institute of Technology alumni. The word is not getting out about the benefits of belonging to the Alumni Society; consequently, we are establishing, for the first time, a formal membership campaign. All non-member alumni will receive a letter describing the benefits of belonging to the Alumni Society, while all member alumni will be encouraged to become Life

Architecture students top international French competition

A team of five architectural students tied for first place in an international competition to redesign Les Halles, a wholesale food market that is now a giant hole in the ground in the center of Paris, France.

The students competed with more than 600 projects, many of which were entered by professional architects in the U.S. and abroad. Their winning design called for a World Information Center complete with laser communication and an international computer center for the controversial site.

"The force of the Minnesota team's ideas" impressed the international jury of critics and architects, including the famous American architect Philip Johnson.

All five team members will complete their undergraduate studies in architecture this year. They are Ngu Aloysius Bonga, James V. Dahlberg, Timothy J. Dray, Richard E. Ness, and Shi-Ming Tam.

School of Architecture head Ralph Rapson said that "the results of the

Members (a good investment in these days of high inflation).

These then are the plans and objectives of the IT Alumni Society. Our effectiveness would be enhanced if *you* would let us know what *you* think we should be doing, and how our projects can be more relevant to the needs of alumni. Please feel free to write or call me or any of the board members about your ideas. My phone number is (612) 890-3507, and I guarantee you a response to any call. Also, get involved in what we are doing in ITAS. Speaking from experience, I have received much more in enjoyment and satisfaction than I have given in time and effort. We have something special happening between one of the nation's best technology institutes and a very active alumni society. Help us accomplish more in 1980!

**George A. Champine, President
I.T. Alumni Society**

competition are indicative of the quality of these students and of the University's program."

The Paris competition was organized by young French architects in protest of government proposals for the famous market quarter.

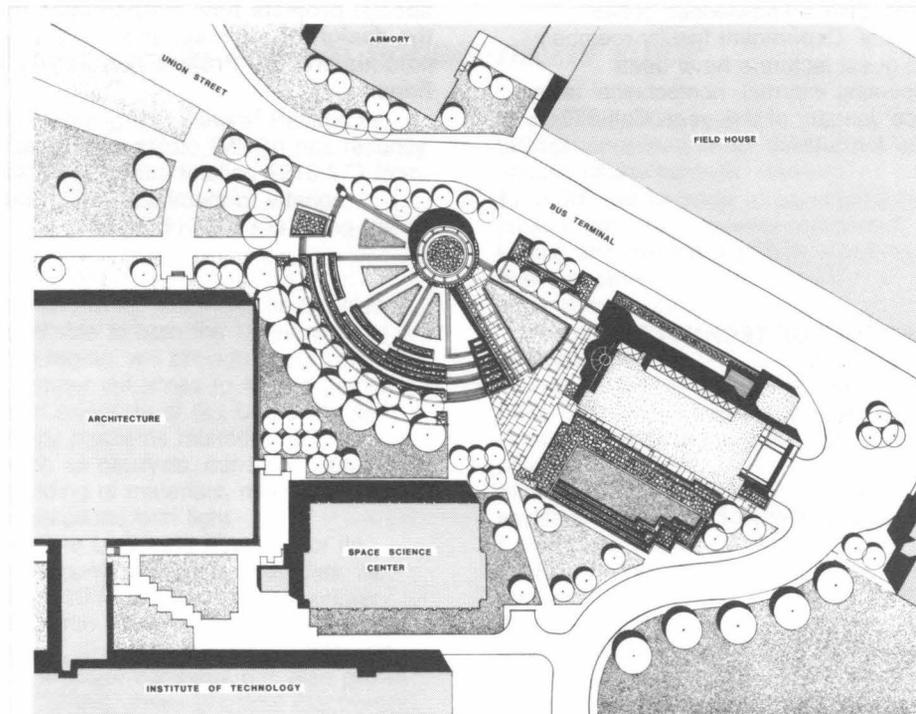
Van der Ziel, from page 1 . . .

give a comprehensive picture of how I view the field, and to help other people in taking it a little bit further."

Professor van der Ziel, age 69, will be retiring from teaching at the end of the 1980-81 school year. He will continue his research at the University of Minnesota in the areas of quantum noise at high frequencies and low temperatures, I/f noise, and infrared detection and mixing at 10 microns; and also continue to act as graduate research professor at the University of Florida for one quarter during the year. A book on "device noise" is also a possibility for the future.

About the IEEE award, van der Ziel comments, "I think it's nice to be recognized, nice to know that you have a few friends around here and there who think well of you. But I am satisfied with what I am doing—I find it intriguing and rewarding."

One of these rewards has come in his relationships with his graduate students. "What I like especially is to see a young candidate come in, pretty green around the gills and uncertain of himself, and in a few years he becomes a very accomplished, confident engineer. That is one of the nicest sights—to see such a development occur."



Site plan (North up) for new CME building.

CME Department heads underground

Natural sunlight will bathe students and faculty as they work 100 feet below the earth's surface in the new \$16.5 million Civil and Mineral Engineering (CME) building, now under construction on the University's East Bank. The structure, which makes use of energy-conserving solar, landscape, and earth-sheltered systems, will be both functional and attractive.

Solar optical systems can collect, concentrate, and direct sunlight through the interior of buildings by an assembly of mirrors and lenses. Such a system will be used in the CME building, on a limited basis, to demonstrate its energy-saving capabilities as well as to provide the psychological benefits of natural sunlight. When used with conventional artificial light under controlled conditions, the solar optical system has the potential to greatly reduce energy costs for lighting interior spaces.

In addition to the solar optical system, solar heating, solar electricity generation, and ice energy cooling will be used.

Landscaping is another important component of the building's environmental control system. Deciduous trees and vines will provide sun-screening during the summer and, by shedding their leaves, allow for passive solar heat gain during the winter months. Different types of ground cover will be planted around the building in an attempt to reduce heat loss.

The CME building will be earth-sheltered, with 95 percent of its total space below surface grade. The primary advantage of this type of structure is that the total energy demand, mainly in the areas of heating and cooling, will be less than half of that required for a similar above-ground building.

Nearly one-third of the building will be in the mined space 100 feet below the surface. This area will house laboratories and offices, including the Environmental and Mining Laboratories and the Underground Space Center. Not only will some of these areas receive natural sunlight, but the Underground Space Center's reception room will also have a remote view optics system. Using the principal of the periscope, this system will project a

view of the site area from a second-story window perspective. Though not specifically energy-related, the remote view optics system is designed to enhance the habitability of underground space.

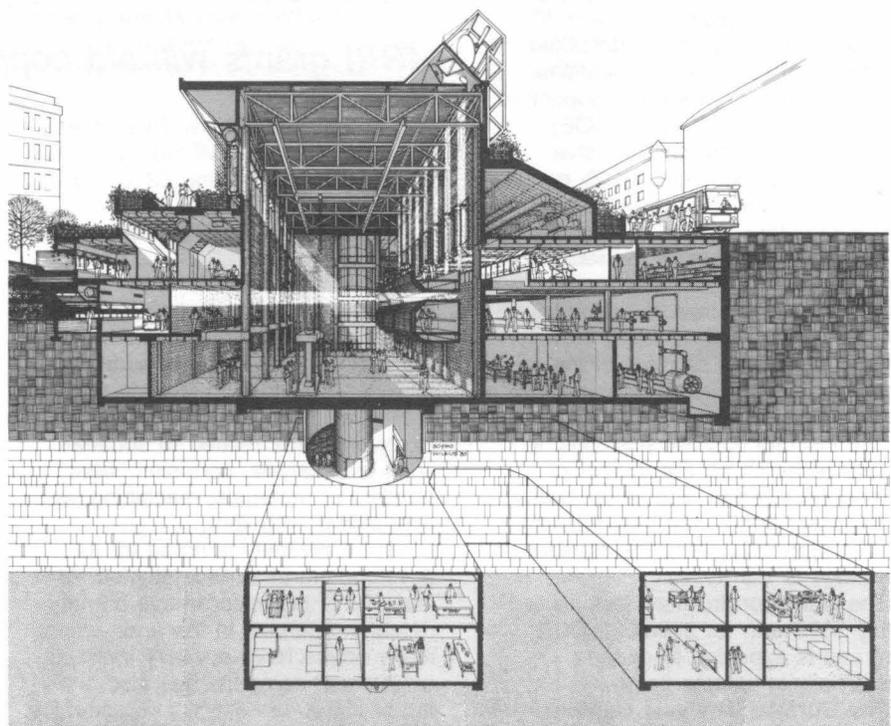
In addition to being energy efficient and attractive, the CME building will also solve space and facility problems currently facing the department. There will be general purpose classrooms, a 200-seat lecture hall, a student commons room, administrative, faculty, and graduate student offices, and offices for public service functions like those provided by the Underground Space Center. The building will also

house areas for research in Environmental Engineering, Soil and Rock Mechanics, Water Resources, Mineral Engineering, Structural Engineering, Transportation Engineering, Surveying, and Construction Materials.

The CME building was designed through a combined effort of the CME faculty and Myers and Bennett Associates, the architectural firm chosen by the State Designer Selection Board. Researchers from CME's Underground Space Center will document the cost and performance of the building with the intention of providing much-needed data to assist in the design of future earth-sheltered buildings.

The CME building is scheduled for completion by the fall of 1982.

A sectional perspective of the underground building shows five energy systems: a solar optical system (upper right); a trombe wall (upper left) for passive solar storage, and below it, the solar shading of deciduous plant material; the earth sheltering achieved by building 95 percent below grade; and mined space (bottom two sections).



Interdisciplinary impacts gained through three new centers

A trio of important interdisciplinary centers have recently been established in the Institute of Technology. All three will have extensive science, technology, and design impacts nationally and internationally.

Each of these center's emphasizes the involvement of corporations in Minnesota and beyond.

A regional **Center for Microelectronic and Information Sciences** has been initially funded with a \$2 million grant from Control Data Corporation. Its program will be designed primarily to strengthen the national fiber in the area of microelectronic and information sciences, i.e. computer science and technology.

A number of other companies are expected to participate in the center, and private funding can be matched with federal funding to enlarge the program.

In addition to its research commitment, the center will also develop major educational programs for both University students and professionals.

The center will include work in four major areas: fundamental studies of microelectronic materials, study and development of automated manufacturing processes, distributed systems, and computer applications.

The Corrosion Institute, supported by a Department of Energy (DOE) grant, will study and try to resolve major issues of corrosion which cause premature failure of equipment in the energy industry.

A study conducted at the request of Congress by the National Bureau of Standards showed that corrosion of metallic materials alone costs the nation \$70 billion. The work of the Corrosion Institute will try to reduce this enormous cost.

The institute has two missions: to conduct research on the frontier of engineering science, and to educate. An important part of the latter activity involves professionals or the transfer of technology to the public.

The Corrosion Institute was started in July 1979 with an \$650,000 DOE grant and is expected to expand substantially in coming years.

The Surface Analysis Center resulted from a \$1.5 million grant by the National Science Foundation. The



CONTROL DATA CORPORATION'S \$2 million gift to IT's regional Center for Microelectronic and Information Sciences was accepted by University President C. Peter Magrath, left, and IT Dean Roger W. Staehle, right. William C. Norris, center, Control Data's chairman and chief executive officer, made the presentation.

MRRRI grants will aid copper-nickel study

IT's Mining and Mineral Resources Research Institute (MRRRI) has recently received grants totaling \$210,573 from the U.S. Department of Interior.

A grant of \$100,573 is being used

center, which will make its facilities available to both the University and to the region, will provide opportunity for member industries to work together with scientists at the University to study problems related to surfaces, such as catalysis, corrosion, wear, bonding of materials, machining, and interactions with light.

The University is noted for its development of surface studies. At least 10 IT professors have primary research interests in the area, while many others have auxiliary interests.

A major company has also grown out of this area—Physical Electronics, a leader in the manufacture of instruments for studying surfaces.

to study possible uses of copper-nickel tailings, according to Dr. Ken Reid, director of the institute. Another \$110,000 will be used to continue a project that covers a wide spectrum of mining and mineral activities, to pay for new equipment, and to cover administrative costs.

"Although energy research is certainly a top priority, the nation's mineral resources are declining and there is an urgent need to devote a considerable amount of our research dollars to increase our knowledge in these areas," said Joan M. Davenport, assistant secretary of the Interior for Energy and Minerals.

She singled out a particular research project at the University institute which could be of great benefit to the nation's steel industry. "We have been lagging behind other countries in modern steel production technology. If this institute project is successful, it could provide a competitive advantage."

'Starwatch' answers celestial questions

What stage is the moon in? What planets are visible in the Minnesota sky? What are quasars and black holes? When and why do we have meteor showers?

These and other questions can be answered by Minnesota Starwatch, a service offered by the University's Department of Astronomy since late 1979.

A taped telephone message on the night sky in Minnesota, Starwatch is prepared by the students and staff of the Astronomy department, and includes information on the seasonal night-time sky along with brief explanations of different aspects of the universe.

Interested persons can call (612) 376-5587 for the Minnesota Starwatch message. The messages are updated every two weeks and are available 24 hours a day.

Starwatch came about in response to increased public interest in celestial events, according to Dr. Butler Burton, department head.

A second astronomy program, a series of talks on astronomy-related topics, also acknowledges public curiosity. Department faculty members and guest lecturers have been presenting informal, nontechnical talks since January of this year. Call 373-4686 for details.



THE FOURTH ANNUAL MATH BRIDGE program brought approximately 150 minority eighth graders to the Institute of Technology in February and March. The students, from Minneapolis and St. Paul area schools, joined a motivational program run by the IT Dean's staff and secondary school mathematics teachers who identified junior high school students talented in mathematics and worked to stimulate them to continue college preparatory courses. On six consecutive Saturday mornings students learned through special projects how mathematics is integral to such activities as string art, the design of mobiles, and calculator games. The Math Bridge program is administered by Project Technology Power, under the direction of Dr. Barbara Edgar.

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