

precis

inside

Volume 15, Number 10, November 5, 1984

A Model
Simulation
of TMI



UMCP Receives \$1.5 Million Stock Gift

UMCP has received a major gift of 300,000 shares of stock currently valued at \$1.5 million from Michael D. Dingman and The Signal Companies, Inc. Dingman, a Life Member of the UM Alumni Association/International, is President of the California-based high technology and engineering firm ranked 85th in sales in the nation by the 1984 Forbes survey. In presenting the stock gift to the University of Maryland Foundation, Dingman indicated that the gift honors his father, James E. Dingman, who graduated from UMCP in 1921 with a B.S. degree in mechanical engineering and received an honorary degree of Doctor of Engineering from UM in 1960. Before joining the Signal Companies, Inc. in 1983, Michael Dingman was a general partner in the Wall Street investment banking firm of Drexel Burnham Lambert, and Chairman, President, and Chief Executive Officer of Wheelabrator-Frye, Inc., which was the 209th largest industrial corporation in the U.S. when it merged last year with The Signal Companies, Inc. Dingman's \$1.5 million contribution is one of five major gifts totaling \$10.5 million received this year by the UM Foundation.

Nobel Laureate Lecture on Lasers



This year is the twenty-fifth anniversary of the laser. Arthur L. Schawlow, a pioneer in laser technology and winner of the 1981 Nobel Prize for Physics, will deliver this year's Nobel Laureate Lecture—"Lasers and Their Uses" on Tues., Nov. 27 at 4 p.m. in the Physics Lecture Hall. Schawlow is J.G. Jackson and C.J. Wood Professor of Physics at Stanford University where he has been on the faculty since 1961. His lecture is being co-sponsored

by the Quantum Electronics and Application Society to commemorate the centennial of the Institute of Electrical and Electronics Engineers and the 25th year of the laser. Schawlow's research has focused on optical and microwave spectroscopy, nuclear quadrupole resonance, superconductivity and lasers. He and C. H. Townes co-authored *Microwave Spectroscopy* and the first paper describing optical masers, now lasers, for which they won the Stuart Ballantine medal of the Franklin Institute and the Thomas Young medal and prize of the Physical Society and Institute of Physics.

Considering Feminist Perspectives

"Feminist Perspectives on Literature and Art: What Differences Do they Make?" Evelyn Beck will have some interesting answers to that question on Thurs., Nov. 8, when she speaks at noon in Rm. 1102, F. S. Key Hall as part of the Divisional Encounters series of Arts & Humanities. From her unique viewpoint as new UMCP Director of Women's Studies, Beck will take a specialist's look at some well-known authors and artists—Franz Kafka, Gertrude Stein, and

Georgia O'Keefe among them—as she examines the development and changes of feminine perspectives on literature and art. Considering the question of diversity, she will focus on writers of varied ethnic backgrounds, including black and Jewish women writers. The new head of the undergraduate program called one of the best in the nation by the National Women's Studies Assn. is particularly qualified for her topic. She helped establish the Women's Studies Program at the U. of Wisconsin where she taught comparative literature and German. She has written several books and received an NEH grant for research on the role of power, gender and sexuality in the works of Kafka.

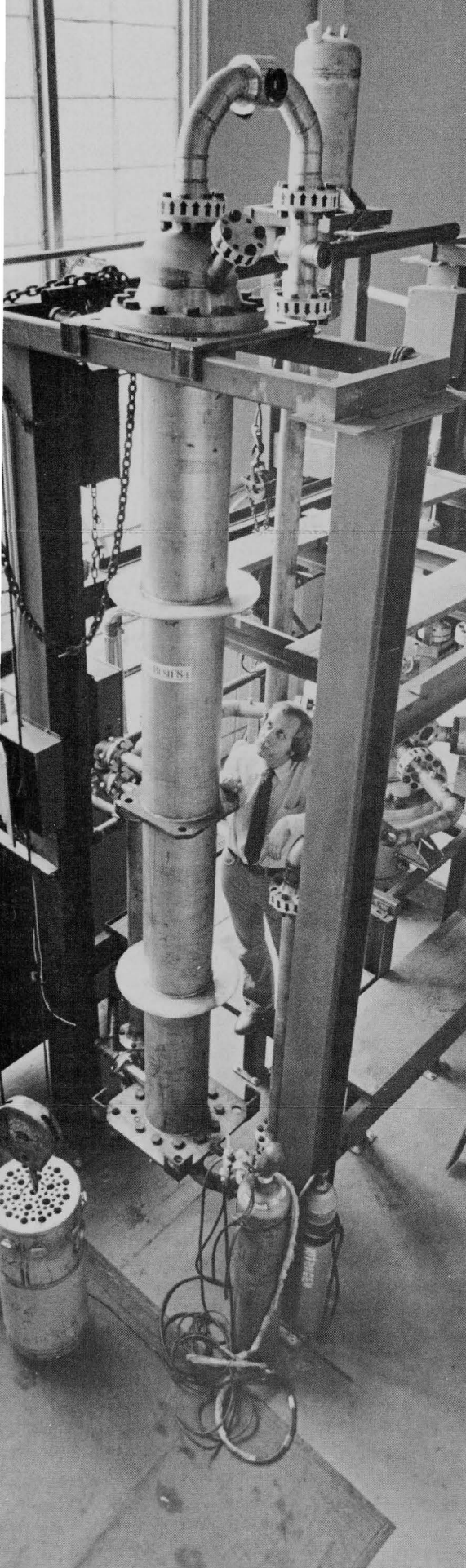
An Evening of Opera at Tawes

Wolfgang Amadeus Mozart's immortal opera, "Don Giovanni," will be presented by the UM Opera Theatre Fri. and Sat., Nov. 16 and 17 at 8 p.m. in Tawes Theatre. Martin Mangold, who has directed the Opera Theatre for the past five years, will direct the performance, and William Hudson will conduct the University Symphony Orchestra. Although "Don Giovanni" was selected this year because "we have an excellent cast enrolled, exactly the right kind of people and voices needed," Mangold acknowledges that the currently-running hit motion picture "Amadeus" is good timing for the Tawes production. "We certainly don't mind that the movie is out," he says. The opera, which stars Gordon Hawkins in the title role, will be performed in the English version translated by Ruth and the late Thomas Martin. The Martins were prime translators of opera both into and out of English and the UMCP production is dedicated to Tom Martin's memory, Mangold says. Tickets are \$7 for adults, and \$4 for students, senior citizens and children. For info. call 454-2501.

Recreating a Renaissance Christmas

On Nov. 30 and Dec. 1 the Grand Ballroom of the Stamp Union will be transformed into a Great Tudor hall, complete with massive coats of arms, huge banners and portraits of knights. The occasion: the fifth annual Tudor Feast, a rousing Renaissance Dinner Theater which will reinact an authentic Renaissance Christmas feast. Presiding over the evening's festivities will be Roger Meersman portraying King Henry VIII for the fifth time, "with his own stomach and beard," according to SU Director Dave Hubler. The three-hour Tudor tour de force will feature 16th century music by the Collegium Musicum directed by Paul Traver and Richard Wexler, as well as court jesters, wandering minstrels and magicians, and falconers with their hawks on the wing. A new masque has been written, impromptu jousting and swordplay among the evening's revelers is planned, and anyone can come in costume, says Hubler. Tickets for reserved tables which seat 10 are available for \$19 per person at the SU ticket office, and they can be charged. Call 454-2803 for reservations and info.





Testing a Reactor's Reactions

Increased understanding of nuclear power plants is goal of TMI model

by Tom Otwell

Like something out of a steam-fitter's nightmare, a 15-foot-high array of stainless steel tubes, pipes and conduits hangs cradled in the arms of its I-beam support in the bay at the rear of the UMCP Chemical and Nuclear Engineering Building.

Replete with heavily bolted flanges, its couplings, fittings, joints and elbows secured with extra strong welds, the massive structure is a working scale model of a Babcock & Wilcox pressurized water reactor.

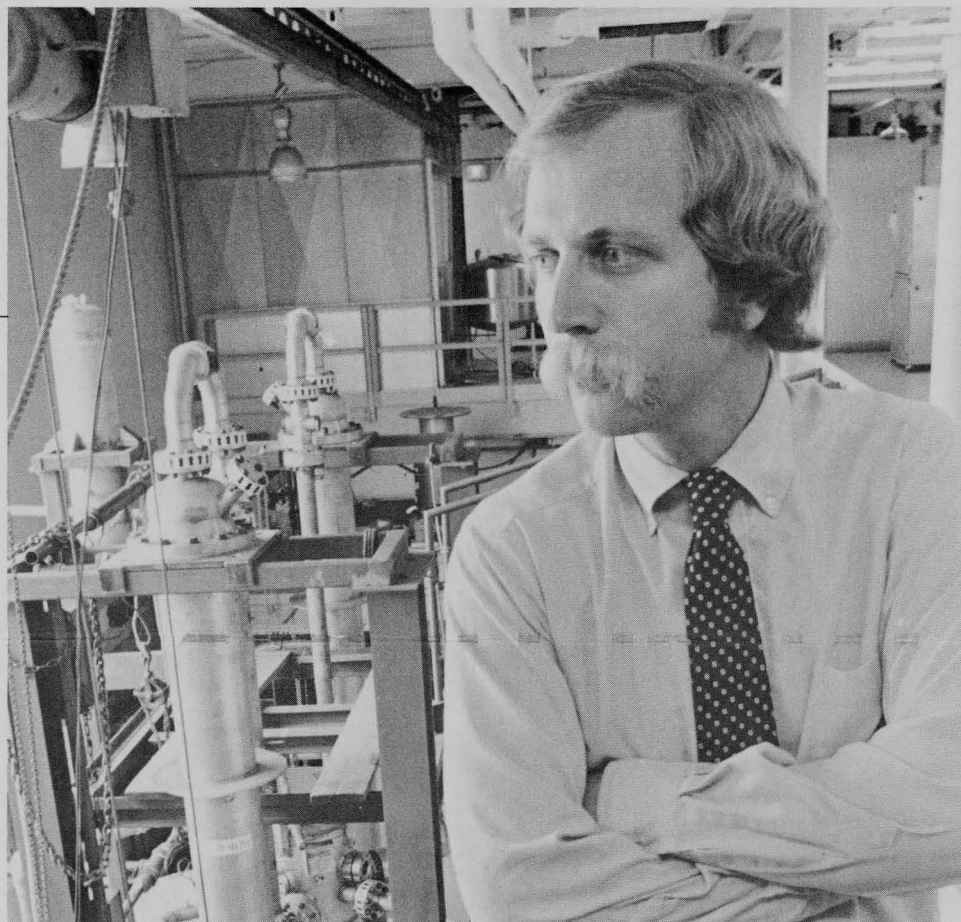
It is the same reactor that is the heart of the accident stricken Unit Number 2 at the Three Mile Island facility at Middletown, Pennsylvania, and a dozen other nuclear-fueled electric power generating plants across the country.

Unlike the 75-foot-tall prototype B & W reactor, fueled by uranium-235 that heats water to 550°F at a pressure of 2,250 pounds per square inch, the UMCP 1:500 volume scale model uses a 200 kilowatt electric heating element to raise the

temperature of the water within the system to 450°F at 300 PSI. In principle, says nuclear engineering professor Gary Pertmer, it is not unlike the electric heating coil that hotel and motel guests use to boil water for a cup of tea or instant coffee.

Under a three-year \$610,000 grant from the Nuclear Regulatory Commission, a team of UMCP nuclear and mechanical engineering professors and graduate students have built the model to carry out basic research in flow phenomena in this type of system to better understand the fundamental heat transfer and fluid dynamics problems associated with two-phase flow within the reactor.

"We have designed the model to test transient, or unanticipated, events that might take place within the B & W reactor system," says nuclear engineering professor Yih-Yun Hsu. "By looking at the behavior of the system during a loss of power or a loss of pumping capacity, for example, we will be able to predict what will happen in a given set of circumstances. We



Gary Pertmer on catwalk above the UMCP TMI model.

will be able to observe the response of the system to a major perturbation."

Sophisticated and extensive instruments will measure temperature, pressure, and rate of water flow in the pipes—all critical in the operation of a nuclear power plant.

The UMCP researchers expect to develop instrumentation and data collection systems for multiple uses and applications.

They will examine system stability during one and two-phase natural circulation, loss-of-coolant accidents (the rupture of a pipe carrying cooling water to the reactor core), the dynamics of steam bubble formation and flow patterns within the U-shaped "hot leg" of the system and how steam vapor is cleared from it.

Frank Munno, Nuclear Engineering Program Director, calls it "a true thermal mechanical simulator." When its extensive state of the art data collection system is complete and in place, he says, the UMCP model will resemble a porcupine. "We'll be able to measure just about anything."

"We envision a versatile, modular mechanical simulator of power plants with adequate instrumentation and control for interactive exercises and experimentation in the areas of power, secondary flow and pump operation," he says. "With this facility, we are putting Maryland on the map,"

says Munno. "There is nothing like it either at other universities or in private sector research labs. What we are doing is basic research into a complex system full of unknowns. We want to dig out new information and sort out old information in the right way."

The project, notes mechanical engineering professor Dirse W. Sallet, was to have begun as a simple pyrex model, easy to build and from which data could be obtained rapidly. From that, a more complex model would be constructed and from that the design and construction of the larger model. Because NRC sought more extensive capabilities and measurement and testing options, design and development of the massive stainless steel model was launched instead.

Support from UMCP came in the form of a \$50,000 grant for instrumentation and for the large high voltage transformer required to provide up to 200 kilowatts electric power. The Baltimore Gas and Electric Company provided welding support and training in special welding techniques needed for working with the stainless steel.

At the heart of the system is a stainless steel reactor vessel specially fabricated for the university by a Cincinnati firm.

With its porthole-like viewing windows, which will allow researchers to observe why and when a series of vent valves open and shut in response to pressures within the reactor during operation, the model vessel looks as though it was designed for deep sea underwater research work.

In fact, before the vessel was connected to the rest of the system a campus wag left a sign on it saying, "Will be back shortly to claim," signed Jacques Cousteau.

Pressurized water reactors, the most common nuclear generators in this country, use ordinary water under pressure to cool the reactor cores. The reactor stimulates and controls the splitting of uranium nuclei in a chain reaction. The resulting energy, as heat, is transferred to a secondary water cycle to produce steam that drives turbine generators to produce electricity. Although simple in principle, the safe application of this technology demands complex, highly sophisticated engineering.

Once the reactor operations begin, the core is surrounded and infiltrated with tons of water, which circulates under high pressure to carry away the intense heat and which keeps the reactor temperature within safe limits.

The 1978 Fuel Use Act restricts the construction of any major new oil or gas-fired electricity plants. At the present time, little new power plant—coal or nuclear—construction is underway. Today, two-thirds of all electricity generated comes from these two fuels.

The economy has been heavily dependent on cheap energy—cheap electricity, natural gas, coal, hydropower and oil. But, except for hydropower, which requires no fuel, these energy sources are no longer cheap.

"It may come as a shocking surprise to Americans that, in a worst case scenario, we may have to routinely accept brownouts, power shortages, or restrict our use of electricity to eight hours a day," Pertmer says. "We really only have two choices," Pertmer says of America's future energy needs. "We can either burn coal or we can burn uranium. Ideally, we should be doing both."

Tribute to Truffaut

On Mon., Nov. 12 at 4 p.m. the Stamp Union Free Film Committee presents free "A Tribute to Francois Truffaut" in the Hoff Theater. The tribute will highlight three of his most famous films, "The 400 Blows" at 4:00 p.m., "Shoot the Piano Player" at 5:45 p.m., and "The Wild Child" at 6:30 p.m. For info call 454-4987.

Learning to Think by Writing

Joan Retallack (Honors) will conduct the first of a three-part workshop, "Teaching Critical Thinking Through the Writing Process," 2-5 p.m. Wed., Nov. 14, Hornbake Library, Rm. 4510. Enrollment is limited; registration deadline is Nov. 7. For details call x2530.

Construction Management Talk

Nicholas Scholtens (Netherlands Export Consultants) will speak on internat'l construction management as the first John J. Kirlin Inc. lecture at 2 and 7 p.m., Wed., Nov. 7, Math Bldg. Rm. 3206, spons. by the new Construction Engr. and Management Program. For info. call x4013.

New Ass't Vice President Sought

Deadline is Nov. 15 for applications or nominations for Ass't V.P. for Academic Affairs at UM, a position assoc. with a broad range of academic policy responsibilities, including faculty appointments and promotions. Richard Jaquith (Ass't V.C. for Academic Affairs) is the UMCP representative on a six-member search committee. For info. call 853-3611.

Media Textbook by Geraci

Philip Geraci (Jour.) has co-authored a mass media textbook to be released in '85, and has published in *Jour. Quarterly* an article analyzing *USA Today* reader interest surveys. He now is on special assignment researching computer imaging in print media.

Third-World Rural Development

Rolando Pinzon, an Honduran agricultural engr. and a fellow in the Hubert Humphrey Fellowship Program, will discuss "Appropriate Technologies: Alternatives for Rural Development" of third-world countries, 12:30-1:30 p.m. Wed., Nov. 7, Lefrak Hall Rm. 1179, as part of the Humphrey development series. Call x6918 for info.

Beatty Honored by Association

Charles Beatty (Indus., Tech. & Occu. Ed.) was honored for his accomplishments by the Md. Indus. Arts Assn. at a recent conference.

Carlson Leads Museum Program

John Carlson (dir., Ctr. of Archaeoastronomy) will discuss the "Golden Age of the Aztecs," at a Smithsonian Inst. program Nov. 11-16. For registration details call the Smithsonian Lecture and Seminar Program at 357-2475.

New School Sup't to Speak

John Murphy, new sup't for Prince George's County schools, will discuss his vision for public education at 7:30 p.m. Mon., Nov. 12, at the College Park Municipal Ctr., 4500 Knox Rd., at a mtg. of the AAUW.

Supervision Seminar

A two-day seminar on principles of supervision, "Training for First-Line Managers & Supervisors," will be held 9 a.m.-4 p.m. Tues. & Wed., Nov. 13 & 14, Marie Mount Hall, Md. Room, spons. by the Personnel Dept. Cost is \$35, payable by Interdept. Billing. Regis. deadline is Nov. 7. Call x4811 for info.

Sri Lankan Lecture

Kenneth Corey (chairman, Geog.) will speak on "Village, Town, City: The Dynamics of Change," Wed., Nov. 14, as part of a lecture series by the Smithsonian Resident Assoc. Program and the Embassy of Sri Lanka.

International Programs Lecture

Jay Stauffer (Penn. State U., fishery sci.) will discuss "Systematic Problems Assoc. with the Lake Malawi Species Flock, 12-1 p.m. Mon., Nov. 12, Marie Mount Hall Md. Room, spons. by the Office of Internat'l Programs. Call x6407 for info.

Talk on Politics & the Media

At a Md. U. Club dinner Fri., Nov. 16, Kathleen Jamieson (Comm. Arts & Theatre), a leading authority on politics and the media, will give a post-election analysis using videos. Dinner begins at 6 p.m. Cost is \$15. Call x3940 for reservations.

Leatherman Honored

Stephen P. Leatherman (Geog.) has been selected as one of the Outstanding young Men of America for 1984, honoring those between 21 and 36 years old.

Managing Conflict

Fred Leong (Psych.) will discuss "Culture, Communication and Conflict," 12 p.m. Fri., Nov. 9, South Admin. Rm. 2118, spons. by the Coalition for Cooperative Research & Devel. for Conflict Management. For details call x4191.

Sands on Breast Cancer

Doris Sands (Health Ed.) will lead a discussion of "Breast Cancer and Sexuality," 9:30 a.m. to 12 p.m. Sat., Nov. 10, at the College of Physicians in Phila., a free workshop spons. by the American Cancer Society.

Architectural Display

Suzie Kim of the Boston architectural firm of Fred Koetter & Suzie Kim will lecture on "Recent Work," 5 p.m. Wed., Nov. 7, Architecture Bldg. Rm. 0204. For info. call x3427.

UCC Piano Recital

Angela Cheng, winner of the 14th annual UM Internat'l Piano Competition, will perform works of Handel, Beethoven, Ravel, Chopin and Liszt at 8:30 p.m. Fri., Nov. 9, Tawes Recital Hall, as part of UCC's new Keyboard Series. General admission is \$9. Call x6534 for info.

Faculty Videos Available

Videotaping is avail. to any faculty member who wishes to scrutinize his/her classroom performance. Applications are avail. through Paul Malec, Hornbake Library non-print media. Call x2530 for info.

G & P Faculty Present Papers

Some 25 members of the Gov't & Politics Dept. faculty presented papers or took part in panels at a recent American Political Science Assn. convention, probably the highest ratio achieved by any political science dept. in the U.S.

Red Cross Blood Drive

The American Red Cross will take blood donations 10 a.m. to 4 p.m. Fri., Nov. 9, Hornbake Library paperback section. For info. call x2052.

Volunteers Needed for Vitamin Study

Male volunteers age 25-35, 45-55 and 65-75 are needed for a study to begin in Dec. or Jan. by the Dept. of Food, Nutrition & Inst. Admin. on the effect of age on the absorption and metabolism of Vitamin B-6, a project approved by the Nat'l Inst. of Aging. Study subjects will be paid \$30. For info. call x5223 or 434-0749.

precis
Editor Roz Hiebert x5335

Nonprofit Org.
U.S. Postage
PAID
College Park, MD
Permit 31