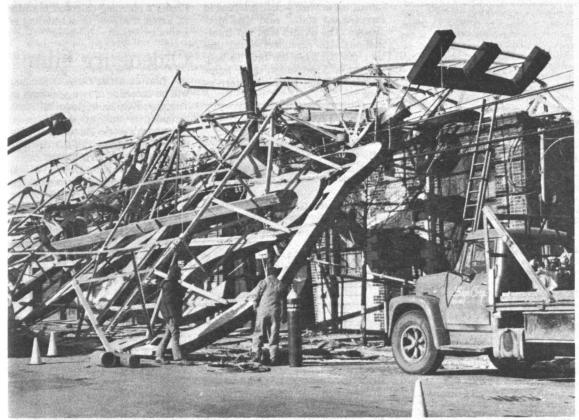
Massachusetts Institute of Technology

February 4, 1976 Volume 20 Number 25

# Wind Razes Cains



Remnants of the Cain'g sign littered Vassar Street yesterday after it crashed during Monday's windstorm. The

landmark-shown as it was below-was far too familiar to West Campus residents who celebrated its demise.

Winds gusting up to 90 miles an hour Monday night accomplished what generations of MIT students could not.

It blew over the neon "Cain's Mayonnaise" sign at 275 Vassar St. across from MIT's west campus.

William Adams, a vice president of John E. Cain Co. of Ayer, makers of prepared foods including a popular brand of mayonnaise, and himself a 1933 graduate of MIT, said the firm is as yet undecided about re-erecting the large sign. Cain, he said, has centralized its operations in Ayer and the Vassar St. building is presently leased to H.A. Hovey Co., suppliers of dairy products for Boston area restaurants.

The sign tumbled forward onto Vassar St. Mr. Adams said he understood it was a total loss. In addition, when the sign and the steel frame to which it was attached fell, it caused damage to the building roof.

The sign has been there almost

Media Cover

Ronald Reagan and George Wal-

lace have received more attention

from the media than all the rest of

the presidential candidates com-

bined, with the exception of Presi-

presidential campaign, the research

team said that Democratic candi-

Ingenuity I

longer than anyone can remember. Mr. Adams said it was originally placed there before MIT's west



campus was built on and, in fact, before Boston University's main buildings on Commonwealth Ave. in Bos-

dates, aside from Wallace and Jim-

my Carter, tend to be lumped to-

gether as the "Democratic pack" by

news outlets. "Carter," the group

said, "has managed to move away

The report cited these other pre-

the study, the report said.

Wallace, Reagan Most

ton were erected. Mr. Adams said he understood the sign was originally erected on the building in order to be seen by travellers along Boston's Commonwealth Ave.

For MIT students whose dormitory rooms face the sign, the Cain's landmark has long been a source of irritation because its light shone through their windows. For years, students have made bitter jokes about the sign and last year students organized an IAP project to explore what might be done about it. Other neighbors, primarily those on the other side of Vassar St., also have complained and Mr. Adams noted that for the past several years the company has not operated the sign

The sign, however, was there before the dormitories. Mr. Adams, for example, recalled that when he was a student Vassar St. itself in that area was nothing more than a dirt

-Candidates are often "labeled"

by the press early in the campaign.

While this labeling may only be a

kind of journalistic shorthand for

takes and tends to shape deeper per-

(Continued on page 8)

# X-ray Burst Pattern Puzzles Physicists

By BARBARA BURKE Staff Writer

Brief intense bursts of x-rays from space, recently reported from observations by the Dutch astronomy satellite (ANS), recur in a pattern unlike anything ever before detected, MIT physicists reported Wednesday (Jan. 28).

The bursts flare up in less than half a second, die down in 10 secondsand recur every 15,718 seconds, or about once every four and a half

Such a big discrepancy between the duration of an x-ray burst, and the interval between bursts, is unheard of in x-ray astronomy.

"But the strangest thing, the thing which has us so intrigued, is that although they recur on an average every 15,718 seconds, they don't come on schedule," said Professor George W. Clark of MIT.

'There's a 'phase jitter' of about 500 seconds one way or the other; the

longest has been 1,000 seconds."

The finding was reported Wednesday afternoon by graduate student Jesse G. Jernigan, Jr., at the x-ray astronomy meeting of the American Astronomical Society, High Energy Astrophysics Division, held at MIT Jan. 27-29. Notice of the discovery has been sent to astronomers by an International Astronomical Union Circular.

The strange periodicity of the x-ray bursts was discovered by analyzing data from SAS-3, the x-ray astronomy satellite of the National Aeronautics and Space Administration. The satellite, launched last May, is operated by MIT researchers under the direction of Dr. Clark, professor of physics, and member of the MIT Center for Space Research.

Working with Professor Clark and Jernigan have been Dr. Claude R. Canizares, assistant professor of physics at MIT; Professor Satio Hayakawa, visiting professor from

(Continued on page 3)

# Arthur C. Clarke to Speak At Telephone Symposium

Arthur C. Clarke, who conceived the idea of the communications satellite, will speak on the future of communications at a March symposium at MIT co-sponsored by MIT and the American Telephone and Telegraph Company.

The symposium, which will take place March 9-10 as part of the 100th

anninvesary of the telephone's invention, will bring together international leaders in education, science, engineering communications, business government to assess

various aspects of the future impact of communications on society.

Several hundred seats are expected to be available to the MIT community for Clarke's speech in Kresge Auditorium. Arrangements also are being made to have the speech shown on closed circuit television in Room 26-100. Procedures for distributing tickets will be announced at a later date.

Clarke, an authority on space ravel and a noted science writer, is the co-author of the book and the movie, 2001: A Space Odyssey.

at MIT, he wrote to President Jerome B. Wiesner that he first thought of the communications satellite while working at MIT's Radiation Laboratory during World War II on problems associated with the ground control approach system by which military aircraft were guided to landings in bad weather.

Clarke won the Franklin Institute's Gold Medal in 1963 for having originated the communications satellite in a technical paper published

He has won a number of other awards for science writing and he is (Continued on page 8)

# Wiesner Elected OTA Chairman

MIT President Jerome B. Wiesner has been elected chairman of the Advisory Council of the Office of Technology Assessment (OTA), a branch of Congress established in 1974 to assess the potential uses and effects of technology.

President Wiesner, who served as White House Science Advisor from 1961-64, has been active as a member of the OTA advisory council since its

Announcement of the appointment vas made by US Representative Olin E. Teague of Texas, chairman of OTA's governing Technology Assessment Board. Representative Teague is also chairman of the House Committee on Science and Technology.

Market

#### from the 'pack' and get distinctive attention." dent Gerald Ford, according to the headline purposes—some examples. MIT News Study Group. "The Populist Candidate" (Harris) The "pack" finding was one of four and "The Kennedy Connection" In an interim report on its moni-In accepting the invitation to speak (Shriver)—frequently toring of press coverage of the 1976 patterns that have so far emerged in the label

liminary findings:

By PATRICIA M. MARONI

Staff Writer Student inventors at MIT who this winter parlayed electronics expertise and merchandising genius into a design for a low-price home TV Tennis game, have scored a major busi-

ness success on their first try.

More than 12,000 sets were actually produced during the Christmas shopping season, amounting to half a million dollars in wholesale volume for Executive Games, Inc., of Dorchester, Mass., manufacturer of the product and original patron of the MIT inventors. A backlog of 400,000 orders from retailers around the country could result in another \$16 million in coming months. There are

some predictions that the games project will gross hundreds of millions of dollars over the next few years, since a TV hockey game is now in the works.

Another benefit of the innovative agreement between students and investors has been the creation of 100 additional factory worker jobs for the manufacturer in three different New England industrial locations.

The students' version of the familiar electronics net game, once found only in game rooms of nightclubs and bars, retails for \$69.95. Competitor prices for the adaptable home model are still over the \$100 mark, according to Glen Dash (MIT '75) of Chicago, Ill., who devised the circuitry for TV Tennis.

Dash's transformation from a young graduate engineer working for a calculator company to an entrepreneur excellente began when he accepted a challenge from Peter Stepanek, president of Executive Games, Inc.

After reading an article in the Wall Street Journal on the MIT Innovation Center-multi-faceted laboratory for inventors like Dash-Stepanek wondered whether a marketable games package could be brought into economic reality. Although nearly retired from the home entertainment business, he approached the director of the innovation Center, Professor Y.T. Li, with a description of his idea

and offered \$20,000 to get the project started.

Dash discovered he could put the idea into practical use by combining the engineering knowledge of four Delta Tau Delta fraternity brothers: David Agans of Middlesex, N.J., Michael Shields of Fairfax, Va., Gabor Szakacs of Tampa, Fla., and Joseph Corkery of Moline, Ill., all now seniors in electrical engineer-

As participants in the MIT Innovation Center, which was established two years ago with support from the National Science Foundation, the students, besides inventing the product, were required to submit a business plan outlining the product's

essential concepts and desirable specifications, a study of the competitive and patent positions, a market survey, and an estimate of its potential sales volume and estimated cost.

Dash, who is now employed as chief electrical engineer for Executive Games, Inc., predicts that production levels will soon reach 3,000 sets a day as plans are made to extend distribution into Canada and abroad. To satisfy the demands of the consumer market during the Christmas season, Executive Games added approximately 40 employees to their Dorchester operation with plans to expand that number by at

(Continued on page 8)



#### Announcements

Cross-Registration to Harvard-Second term cross-registration deadline is Mon, Mar 1 for all schools except Harvard Business School Harvard Business School deadline is Mon. Feb. 9. No petitions will be accepted after these

English Classes for Foreigners-Course 23.41 is open to all undergraduates, graduates, and academic employees. Spoken English: conversation, vocabulary, and oral drills, will meet Wed, 2-5pm or 7-10pm, Rm 4-152, Written English: American style of composition and organization, with grammar review, will meet Thurs. 7-10pm, Rm 14E-311. Info: Linda Sibley, 10am-12n, or Barbara Raither, Thurs, 3-5pm, Rm 14N-221, x3-3925.

Hillel Courses-Hillel is offering courses this term in language and literature, the arts, Talmud and Midrash, and the ecumenical Bible. Special workshops will also be offered. Complete schedule available in Hillel office.

Student Scoutmaster Program-Meeting for scouts interested in helping out Cambridge troops will be held Thurs. Feb 12, 7:30pm. Stu Ctr West Lge. Cambridge troops are floundering, and APO would like to encourage groups of 4-6 scouts to help build these troops up. Please help.

March Exam Period-Petitions for postponed final and advanced standing examinations must be returned to Schedules Office, E19-338, by Fri, Feb 6.

IAP Grade Reports-Grade reports for IAP will be mailed to term addresses on Fri, Feb 6.

Why Be at MIT?-Writing and discussion group for those who study, teach & work at MIT. First meeting Thurs, Feb 5, 12n, Rm 8-205. Bring along some idea of what you would like to get out of the workshop. Special topics credit can be arranged for students. Info: David Soule, 247-9364 or Seth Racusen, x3-6475.

Writing Program-Any undergraduate who has taken Writing Program courses and would like to be a teaching assistant should contact

the Program office, Rm 14E-310, x3-7894. Summer Preprofessional Programs-Roswell Park Memorial Institute of Buffalo, NY, will sponsor a research participation program in science June 21 through August 20, 1976. The program includes research in biology, chemistry, physics, biochemistry, biophysics, biostatistics, genetics, and endocrinology. Students will work under the supervision of a senior staff investigator. The program is designed to introduce the student to a research atmosphere and to help in career planning. Undergraduates will receive \$45-60 per week for a maximum of nine weeks. Applications must be received by April 1, 1976. Summer Fellowship Program for Minority Students-Cornell University Medical College-This program has the specific aims of increasing the number of minority-group students in leading medical schools and of increasing their awareness of the great variety in medical career opportunities. Premedical students who have completed their junior year spend 10 weeks as summer Fellows at the Medical Center. The Fellows, who receive a stipend of \$100 per week, work three days a week at research activities and two mornings a week in a specially designed course in cardio-vascular physiology. Two afternoons are used for a series of discussions of health problems of ghetto communities and visits to a neighborhood health center program. Applications should be made early in the junior year and not later than April 15. 1976 Medical School Familiarization Program-This program is offered by the University of Texas Medical Branch, Galveston, to provide black and Mexican American students the opportunity to observe the activities of a medical center. The program runs from June 7 to July 2, 1976. It will provide the student with insight into the curricula of a medical school and a better understanding of a medical school complex and its functions. Stipend is \$550 for the four week period. Application deadline is March 1, 1976. Baylor Surgery Laboratory Program-This program helps to develop and maintain the interest of well-qualified students who have a medically oriented career in mind. Students assist in scheduled experiments as well as conduct independent experiments. A stipend to help defray living expenses is provided. Applications are to be completed as soon as possible. Mellon Summer Research Program in Psychiatry for Undergraduates-This program is held at the Western Psychiatric Institute and Clinic of the University Health Center of Pittsburgh. It provides six fellowships to college juniors and seniors for an eight-week research experience in psychiatry, June 7 to July 30 This will involve close collaboration with faculty conducting investigations in clinical and basic psychiatric research. The deadline for application is March 1, 1976. There is a stipend of \$750 plus expenses. For further information on any of the above contact the Preprofessional Adivising and Education of-

#### Placement

The following companies will be interviewing during the time period covered by the current Institute Calendar. Those interested may sign up in the Career Planning and Placement Office, Mon-Fri, 9am-3pm, Rm 10-140, x3-4733.

Thursday, February 5-The Aerospace Corp; Booz. Allen & Hamilton, tech service grp; Caltex Petroleum Corp; Intermetrics, Inc; National CSS, Inc; RCA Corp; US Army Materiel Command; U of S Calif, sch of engineering. Friday, February 6-The Aerospace Corp; American Can Co; Burroughs Corp; Pension Benefit Guaranty Corp; Schlumberger Well Services; Ralston Purina Co. Monday, February 9-Lutron Electronics Co. Inc.; McDonnell Douglas Corp; St. Louis, Mo; McDonnell Douglas Astronautics Co, W Huntington Bch, Calif; Polaroid Corp; Turner Construction Co; Westinghouse Elec Corp. Tuesday, February 10-McDonnell Douglas Corp, St Louis, Mo McDonnell Douglas Astronautics Co. W Huntington Bch, Calif; Westinghouse Electric Corp; Corning Glass Works; HJ Heinz Co; FMC Chemical Grp; Lawrence Livermore Lab; Sanders Assoc, Inc; US Energy Res & Devel Admin. Wednesday, February 11— Corning Glass Works; American Elec Power Service Corp; Crawford & Russell Inc; CS Draper Lab, Inc; Kearfott Div, Singer Co; MW Kellogg Co; Kollmorgen Corp; Micro-Research Corp; Linc Lab; Pattern Analysis & Recognition Corp; Penn Central Transp Co. Thursday, February 12-Kollmorgen Corp; Celanese Corp; First Ntnl City Bank: Grumman Aerospace Corp; Hewlett-Packard Co; ICI United States Inc; Ingersoll-Rand Co; The MITRE Corp; Naval Coastal Systems Lab; Sprague Electric Co. Friday, February 13-Hewlett-Packard Co; The MITRe Corp; Burns & Roe, Inc; Eastman Kodak Co; GTE Sylvania Inc; The Mead Corp; Northeast Electronics.

## **New UROP Listings**

For more detailed information on UROP opportunities listed, MIT undergraduates should call or visit the Undergraduate Research Opportunities Program Office, Room 20B-141, Ext. 3-5049 or 3-4849 unless otherwise specified in the listing. Undergraduates are also urged to check with the UROP bulletin board in the main corridor of the Institute.

Call for Proposals!

If you haven't read the "How to Participate" section of the 1975/76 UROP Directory, do it now. All that information was put together for you with loving care and won't fit in this column. Spring Term Proposals: Feel free to start submitting them. General Principles: Don't ask for what you don't absolutely need Be sure to have submitted your past UROP evaluations. Write a good proposal. Announce ment of Awards: Starting the week of February 23rd. Please don't call and bug us that week; answers will get out as fast as we have them. Decisions will be made in order of receipt of proposals until we are broke. Availability of Funds: 1) Generally available for materials and supplies requests within reason. 2) Generally available for overhead waiver requests when faculty or departments offer wages to UROP students. 3) Tougher to get if you're asking for significant wages from UROP itself. Promise: If you've been inventive, resourceful, persistent, and responsible seeking out research support for your UROP work but find there's still an honest-togosh personal deficit you can't swallow, we'll

**Engineering Design Awards** 

Funds are available for undergraduates interested in applying for a Clapp and Poliak Engineering Design Award. These awards should be particularly attractive to students seeking alternatives to term-time jobs. The awards are made to support projects which best suit the donor's stated objectives which are "to give greater recognition to the role of design in engineering education" and "to contribute to the advancement of design as an area of professional study and specialization by providing an opportunity for qualified students to further their education in this broad field." Deadline for submitting proposals is February 20, 1976. Contact UROP for information on guidelines.

Summer Research Programs

Argonne National Lab-Summer research positions are open for juniors and seniors in biochemistry, biology, chemistry, computer science, engineering, environmental science, mathematics and physics. Application dead line is Feb. 13, 1976.

Yale University-Department of engineering and applied science. Summer research projects are available for juniors and seniors in engineering, physics, and chemistry. Application deadline is Feb. 16, 1976. Application materials and information are available at the UROP office.

Historic Urban Physical Patterns and Change

Many urban environments built in this country at the turn of the century are still being fully used today, despite numerous changes in life style and generally urban socio-economic needs. In the early thirties, members of the CIAM (International Congress of Modern Architecture) began to question seriously the urban planning principles upon which urban environments had been and still are being designed. Research is needed to define precisely the characteristics of pre-CIAM urban environments and their successful adaptation to unforeseen developments in the history of cities. Research will concentrate on the study of a few representative city blocks to determine the nature of the spaces involved, the characteristics of the built and non-built environments and their relationships to patterns of responsibility ranging from all public to all private spaces. Undergraduates will have the opportunity to work in collaboration with a graduate seminar studying similar issues and using Boston as a case study. Contact Professor Anne Vernez-Moudon in Rm 5-416,

Cambridge, Ma Dynatech R/D Company Dynatech would like to meet students and faculty co-advisors interested in the following

1) Biocompatible Polymers-An ethical drug delivery system has been developed based on polymers which are slow to release the therapeutic agent. Delivery systems for sustained release through tissue absorbable preparations use implantable cartridges of a tissue compatible hydrolyzable polymer matrix in which the medicant is dispersed. As the polymer disintegrates through hydrolysis into metabolizable fragments, the physically entrapped drugs are released.

2) Fuel Gas from Solid Waste-Dynatech is carrying out a program to develop a process for fuel gas production from the organic wastes produced in food processing procedures. The conversion is by anaerobic digestion, a conventional biological fermentation technique.

New England Aquarium Boston, Ma The New England Aquarium is interested in involving undergraduates in the following research projects being conducted at the Aquarium. 1) Time stability of nutrients in phytoplankton culture medium. (Rudimentary knowledge of statistics and good laboratory technique required.) 2) Trace metal uptake and transport by fresh water algae. 3) Transitional metal trace analysis by gas chromatography. (A year of research experience and good laboratory techniques needed). 4) Separation and characterization of polar organic material from sea water and phytoplankton culture media. (Previous labratory experience and competence in wet laboratory techniques needed.)

Department of Aeronautics and Astronautics

The Man Vehicle Laboratory for a number of years has been involved in the development of computer algorithms for the analysis of clinical records of eye movement. A particular interest has been the problem of automated interpretation of the reflexive eye movements (nystagmus) resulting from clinical, thermal, and rotational stimulation of the semicircular canal in the human inner ear. Measurement (nystagmography) and interpretation of these eye movements is a technique widely used by neurologists and ENT surgeons to evaluate peripheral vestibular disorders. The current method being used is implemented in assembly language on a PDP-8. Reassessment of this method and redevelopment of the algorithms in FORTRAN IV on a new PDP-11/40 graphics computer is in the planning. An opportunity exists for an undergraduate with an interest in the application of computers to clinical diagnosis and some previous mini-computer experience. Contact Professor Charles M. Oman, Rm

## Graduate Studies

**Graduate Residents** 

The Office of the Dean for Student Affairs is now accepting letters and resumes from students, both single and married, who wish to be considered for positions as Graduate Residents in the Institute Houses and in the fraternities. Letters outlining interests and background should be sent to the office, Room 7-133, no later than March 1. Requirements: must be enrolled as a graduate student at MIT with either an MIT undergraduate degree or completion of one year of graduate work at MIT. Remuneration: room for 12 months and board for the academic year. Duties: variedacademic, personal, and social interaction. Further information will be available at a 'mini-orientation,' Wed, February 18 at 8pm in Rm 37-252.

**UN Graduate Student Intern Program** 

The United Nations Office of Public Information will conduct a Graduate Student Intern Program at UN Headquarters, New York, for the four-week period July 26-August 20, 1976 and a Geneva Study Program at the European office in Geneva from July 26-August 6, 1976. The purpose of the programs is to provide the opportunity for an international group of outstanding graduate students to deepen their understanding of the principles, purposes and activities of the United Nations and its related agencies. No stipend, travel costs or living accommodations are provided by the UN. Applications and further information are available from the Graduate School Office. Rm 3-136.

## Faculty Opportunities

**Health Sciences Fund Research Grants** 

The Health Sciences Fund is offering five research grants to MIT and Harvard Medical School faculty in the field of the life sciences and biomedical engineering beginning July 1, 1976. These research grants, which are given in the range of up to \$25,000 (including overhead), are awarded primarily to young faculty investigators to enable them to initiate research projects. Senior investigators are also eligible for awards which will allow them to extend their interests into new fields. In addition, the Fund encourages applications from MIT faculty collaborating with Harvard Medical School faculty, who are pursuing research in the Harvard affiliated hospitals. Interested MIT faculty should submit a summarized research proposal and budget to their department heads prior to March 1, 1976. Each department will choose a single nominee and submit his or her name with substantiating documentation to Dean Irwin W. Sizer. Room 4-234 before March 15th. Selection of the five grant recipients will be made by a committee appointed by Dean Sizer, President of the Fund. These research grants will normally be available for one year, with a possible extension for one additional year.

# Other Opportunities

New York Urban Fellowship

Apply for full-time internship in NY City executive agencies for 1976-77. Information and applications available from Timothy Bird, Rm 4-209 (x3-1368) or Rms 4-246 (Dr. Louis Menand) and 7-108 (Foreign Study-Ms. Paula Kelly). \$4500 stipend. February 15

# Information Center Curtails Phone Information Service

The MIT Information Center will no longer give out student addresses and phone numbers by telephone, Mary Morrissey, director of the Information Center, has announced.

MIT telephone operators (dial operator) will give out student phone numbers as part of their directory assistance service. People wanting student addresses should consult the student directory, contact the student's department headquarters or come to the Information Center (7-111) in person. The center is open from 9am until 9pm.

The phones were just so busy that we were faced with the choice of curtailing the service or being forced to increase our staff," said Miss Morrissey. "The phones kept the Information Center personnel so busy that they did not have the time to help visitors or dispense any other information without constant interruption.'

#### Club Notes

MIT Auto Club\*\*-Meetings third Sun of each month, 7:30pm, Stu Ctr Rm 491.

MIT Ballroom Dance Club\*-Workshops Sun 2-5pm, Sala. Info: 536-1300, Doug King or Carl Sharon.

MIT/DL Bridge Club\*\*-ACBL Duplicate Bridge. Tues, 6pm, Stu Ctr Rm 407

MIT Chess Club\*-Meetings Sat, 12n-7pm, Stu

MIT Goju Karate Club\*\*--Mon, Wed & Fri, 7-9pm, Stu Ctr Rm 407. Info: 536-1830.

Hobby Shop\*\*-Mon-Fri, 10am-6pm, Rm W31-031. Fees: \$10/term for students, \$15/term for community. Info, x3-4343.

MITHRAS-A magazine of & about poetry. fiction, art, etc, is looking for new staff members from MIT community. Anyone interested should contact Jim Adams, x5-7269 Dorm, or Guy Nordenson, x5-8349 Dorm or 494-8974.

MIT Numismatic Society\*\*-First meeting of the term will be Wed, Feb 4, 7:30pm, TDC, 372 Memorial Drive. Info: Mike, x5-6512 Dorm.

MIT Shim Gum Do Club-Instruction by 10th degree black in zen swordsmanship, karate and stick fighting techniques. Beginners always welcome. Mon-Fri, 5-7pm, Stu Ctr 4th fl or Sala. Jeff, x3-5934

Shotokan Karate Club\*\*-Rigorous training for intercollegiate competition & self-defense given by 6th degree black belt. Mon & Wed, 8pm, Fri, 6pm, duPont T Club Ige.

Student Homophile League\*-Gay Lounge, Rm 50-306, open daily for lunch & random other hours, x5-6745 Dorm. Tom, Contact Line, x3-5440, provides info, referrals, counseling or just talking to gay persons. Meetings 1st & 3rd Sun every month, Gay Lge. Consult bulletin board, Bldg 3, for info.

MIT White Water Club\*\*-Pool sessions every 2 weeks, next session Feb 10. All 8pm, Alumni

# Religious Activities

The Chapel is open for private meditation 7am-11pm daily.

Campus Crusade for Christ\*-Family Time Fri, 7:45pm, Rm 37-252.

Celebration of Holy Communion\*\*-MIT Lutheran & Episcopal Ministry. Wed, 5:05pm, Chapel. Supper following, 312 Memorial Dr.

Christian Worship Service\*-Sun, 10:45am, Chapel. Refreshments following service.

Hillel\*-Traditional services Fri, 4:30pm, Kosher Kitchen & Sat, 9am, Chapel.

Islamic Society\*\*-Prayers Fri, 1pm, Kresge

rehearsal Rm B. Prayer Time\*\*-Lunch hour Bible classes led

by Miriam R. Eccles. Fri, 1-2pm, Rm 20E-226. All are welcome.

Vedanta Society\*-Meditation and Gita led by Swami Sarvagatananda. Fri, 5:15pm, Chapel.

## New Subjects

16.793J The Law/Technology Interface (Technology and Law II)

(Same subject as 1.031J, 2.981J, 10.804J, 13.96J & 22.86J) Prereg. One of the following or permission of

instructor: 16.792J, 1.030J, 6.902J, 10.803J, 13.97J, 22,85J, 15.616, 1.83, 11.012 Year: U(2)

3-0-9

An in-depth examination of the interactions between law and technology (assuming an introductory knowledge of law). The major issues to be discussed are the response of the legal system to technological change; the response of technology to changes in the legal system; and the interaction of the political system with the legal and technological worlds. Examples of particular topics are how new technologies can force legal response (SST): how technical limitations inhibit law or policy development (pollution monitoring and control); how technology supports and improves the legal process (scientific tests as evidence, computer research and docketing of cases); how processes designed to regulate the effects of technology operate (setting of health standards); how market or economic regulation introduces second order impacts on technological innovation.

J. Vittek, 3-7572, and N. Ashford, x3-1664.

The Center provides information on programs and activities to people both inside and outside the Institute. Examples of the Center's services include: greeting visitors and providing them with information on locations, programs and specific activities; conducting tours of the campus for visitors and prospective students; maintaining a central calendar of events at MIT and assisting in distribution of publications and registration materials to members of the MIT community.

People planning activities such as Institute lectures, conferences or concerts are urged to consult the Center's planning calendar in order to avoid conflicts in scheduling of major events.

# Oldenburg Film

A film on artist Claes Oldenburg will be screened in two showings on Tuesday, Feb. 10, in Room 26-100, in conjunction with an exhibition of Oldenburg's works currently on view in Hayden Gallery and the Institute of Contemporary Art, Boston.

The film, made by Michael Blackwood and recently premiered at the Guggenheim Museum, will be shown at 7:30pm and 9pm. Admission is free of charge.

# **Echoes**

# 50 Years Ago

The Surgeon General's Committee reported that the use of lead tetraethyl as a knock suppressor was not hazardous to health if the proper precautions were taken. Based on research done at the Institute's Research Lab of Applied Chemistry, Professor Warren K. Lewis agreed with the Committee's findings.

On Wednesday, Feb. 4, Institute employees were sent home early-at 4pm—on account of the most severe snow storm since 1888. The next day, work resumed as normal, but when another blizzard struck, and 10 more inches of snow had fallen, everyone was allowed to leave at 2pm. Major Albert S. Smith, Superintendent of Buildings and Power, spent the night digging out the Institute.

## 40 Years Ago

The February Technology Review reported on the problem of students falling asleep in class. According to medical authorities, the students may not be suffering from boredom but narcolepsy-an ailment which makes one subject to fits of drowsiness. The remedy prescribed by the AMA was a new synthetic drug, benzedrine.

The Institute's Department of Physics announced the development of a gamma ray detector by Dr. Robley D. Evans for diagnosing radium poisoning.

## 25 Years Ago

The Technology varsity rifle team tied the world's record in an eight day tour.

The Registrar reported that a substantially higher-than-usual percentage of freshmen flunked out first semester. It was felt that this was largely due to the insecurity of the students' status created by the "war scare" and threat of the draft.

Prepared by Ethel I. Newell, MIT Historical Collections, x3-4444.

> TECH TALK Volume 20, Number 25 February 4, 1976

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fice, Rm 10-186, x3-4158.

# Expert Warns

# Climbing Food Costs Could Bring Controls

By CHARLES H. BALL

Staff Writer

An MIT food management expert has warned against a "growing cry for government regulation of food prices" unless ways can be found to hold the line on food prices through reduced distribution costs.

Dr. Gordon F. Bloom said that while automation has reduced the labor content of processed foods by 17 percent since 1967, more labor per unit actually was required in distribution.

He said that technology holds the answer to the high costs of distribution, which he calls the "last frontier" of the food industry, but that a communications gap between food industry executives and the technological community has blunted efforts to apply technological innovations to the problems of distribution.

Nevertheless, he said, "if we can fly a man to the moon, we ought to be able to find a way to get a can of peas on the supermarket shelf without human labor."

Dr. Bloom, senior lecturer in MIT's Alfred P. Sloan School of Management and former chairman of the National Association of Food Chains, told a recent symposium that "distribution expense represents a large and growing part of the cost of food to the American public."

"Food has replaced housing as the largest single expenditure in the budget of the average American," he said. "There is a great danger that the American consumer will react to rising food prices as he reacted to rising rental costs—by demanding government intervention in the form of controls over prices. In the long run, this would only discourage production and improvement in efficiency while producing all sorts of distortions in the distribution system."

Because the food industry is a high volume business, where operations are repetitive and labor costs are high, one might expect to find substantial utilization of machinery and automation, Dr. Bloom said. Instead, there has been relatively little technological utilization in the retail food industry, he said.

"Our stores today are larger and more elaborate than they were 30 years ago, but where is the technology? What we have done is to substitute the unpaid labor of the shopper for the paid labor of the clerk, but manual labor still is required to price and place products on the shelves."

Distribution, he said, is "a vast wasteland where gross inefficiencies sap productivity" and is "highly labor intensive."

The rising costs of distribution—which involves packaging, transporting, warehousing and making food available at retail—are already making certain kinds of products economically obsolete, Dr. Bloom said

One example, he said, is carbonated beverages. "How long will consumers pay the price for a system of distribution," he asked, "which

# Correction

The MIT News Office got its MIT history slightly garbled in the caption to a photograph in last week's *Tech Talk* (Jan. 28).

Haryosh Mori, Class of 1877, was not the first Japanese national to enroll, nor did he graduate. The distinction on both counts belongs to Aechirau Hongma, Class of 1874. Mr. Mori attended from 1874-1877.

The abacus Mr. Mori used is now in the MIT Historical Collections and, in a photo last week, was being examined by Howard W. Johnson, MIT Corporation chairman, and Akira Harada, president, Matsushita Electric Corp. of America, on the occasion of the announcement by the Matsushita parent firm in Japan of a \$1 million gift to MIT to establish the Matsushita Professorship of Electrical Engineering in Medicine

ships syrup to a bottler, has the bottler mix it with water and then ship it by Teamster labor to a store where it has to be put on the shelf by high priced labor?"

Within five years, he predicted, "there will be a major market for syrups and powders which can be carbonated at home."

Dr. Bloom said that the recent appearance of canned potato chips was an example of how new products can be developed to replace foods which are fragile, perishable and difficult to handle.

Another class of products requiring reexamination, he said, is frozen foods. Tremendous rises in electrical costs almost certainly will stunt the growth of frozen foods and may price many items out of the reach of the average consumer, he said.

"Development of analog protein foods capable of storage in refrigerated cases or at shelf temperatures would represent a significant technical breakthrough which could open up a wide market for products which might otherwise be substantially restricted by the impact of high energy costs," Dr. Bloom said.

A problem with developing foods that can save distribution costs is that many of these new products may require some sort of additive, he said

"The growth of this class of product—which seems inevitable—will undoubtedly meet with resistance from the Food and Drug Agency and from consumer activists," he said. The possibility of unfavorable FDA review is a risk which may deter many companies from attempting to innovate in this area in order to lower distribution costs, he added.

Dr. Bloom served as chairman of a task force of MIT scientists who assisted the food industry in selecting the symbol now displayed on labels of most grocery products. This symbol incorporates the universal product code for automatic checkout systems now coming into use in the food industry. Dr. Bloom told the symposium the automatic checkout was "the first significant technological innovation to be introduced in the food industry in many years."

He also is one of the originators of an experimental MIT program called TAFI, which stands for Technology Applied to the Food Industry and which is attempting to bring together food industry executives with engineers who have an interest in developing technology for the industry

Dr. Bloom spoke at a symposium sponsored by MIT's Industrial Liaison Program. The program enables member companies, through a variety of services, to utilize the resources of the Institute.

# Blood Drive Help Needed

Volunteers are needed to help prepare for the Spring Blood Drive, MIT's largest drive each year.

The Spring Drive is scheduled March 3-5 and 8-12, according to Vinay Reddy, a sophomore in electrical engineering and computer science who is chairman of the Drive. Especially needed, Mr. Reddy said, are people to work on publicity, and solicitors.

"Even though the Drive is organized by students," he said, "faculty, staff and employees are most welcome as volunteers. We need them particularly as solicitors because they represent a large percentage of the donors."

Those interested in volunteering may sign up in the TCA office, Rm W20-450, x3-4885, or x3-7911.

# Choir to Sing

The MIT Gospel Choir will participate in a celebration marking the opening of the community rooms at the housing complex at 808 Memorial Drive, Thursday, (Feb. 5). The Gospel Choir, with a repertoire of modern gospel and popular music, most recently sang at MIT for the Martin Luther King, Jr., memorial observance.

# Three Receive AMITA Scholarship Awards



Congratulations are extended to three outstanding women seniors, recipients of Alumnae Senior Academic Awards for 1976 from the Association of MIT Alumnae, by Professor ChoKyun Rha, (right) chairman, AMITA Award Committee, and associate professor of food process engineering in the MIT Department of Nutrition and Food Science. Award winners are (from left) Laurel A. Fisher of Phoenix, Ariz., a senior

in life sciences, nutrition; Ellen Scotti of Walpole, Mass., a fourth year student working for an SB in mechanical engineering and an SM in management, and Koon G. Neoh of Penang, Malaysia, a senior in chemical engineering. The awards, given on the basis of academic excellence, include a cash prize and will be formally presented at a brunch Sunday (Feb. 8).

# MIT'Expands' Libraries, Joins Consortium

Without adding so much as one brick or a scintilla of cement, the MIT Libraries have vastly enhanced the resources available to graduate students, faculty members and research staff.

MIT is now a member of the Boston Library Consortium, an association of academic and research libraries founded in 1970 to promote cooperation among members in building research resources and in making collections more readily available.

The official affiliation of MIT with the consortium, which occurred Jan. 14, makes possible several immediate and long-term benefits to the Institute, said Jay K. Lucker, director of the MIT libraries.

The immediate benefits include quick access by MIT graduate students, faculty members and research staff to extensive research collections in areas where MIT does not have a traditional academic interest. Law elementary and second

dary education and Judaica were cited as examples by Mr. Lucker.

Other members of the consortium are Boston College, Boston Public Library, Boston University, Brandeis University, Northeastern University, Tufts University, University of Massachusetts-Amherst, and Wellesley College. The State Library of Massachusetts and the University of Massachusetts-Worcester are affiliate members.

Consortium membership will, in the long run, Mr. Lucker said, permit MIT to concentrate its acquisitions in its main areas of interest.

Mr. Lucker, who is a member of the Directors Committee which administers the affairs of the consortium, said the cooperative venture was born in the realization that selfsufficiency had become impossible because of increasing costs and the expansion of knowledge.

collections in areas where MIT does not have a traditional academic interest. Law, elementary and secontary are second among other large

university libraries—charging for interlibrary loans, Mr. Lucker said. Yale, the University of Toronto and the University of British Columbia have instituted such charges and other universities are considering them, he said.

Consortium members will realize significant savings by engaging in joint purchasing of valuable research materials, Mr. Lucker said. For example, a collection of recently declassified World War II government documents will soon be acquired and will be housed at the Boston Public Library, he said.

Being able to rely on other consortium members for research materials in those areas which are not in the mainstream of the Institute's academic interests will make it possible for MIT to devote more space and funds to its core collections, Mr. Lucker said. In addition, future cooperation may involve having each consortium member assume responsibility for maintaining retrospective material in a specific area, thus relieving other members of the necessity of continuing to house that material.

MIT faculty members and graduate students can obtain a consortium card which entitles them to borrow from other institutions through the interlibrary borrowing office at the Humanities Library, 14S-200. In addition to direct borrowing, interlibrary loans and photocopies are available on an expedited basis, often within two or three days.

# Physicists Puzzle Over Patterns in X-ray Bursts

(Continued from page 1) the University of Nagoya; and graduate student Fuk Kwok Li.

During the past week, the team has been working around the clock in the SAS-3 control room at MIT, in an effort to locate and study the source of the bursts, which is somewhere in the constellation Sagittarius, close to the center of our galaxy.

Jernigan had first noticed what appeared to be an x-ray burst in the SAS-3 data last May, soon after the satellite was launched.

"But because the detector has a big field of view, there was no way to sort it out immediately," Professor Canizares said. "We knew we had seen something, but we didn't know what, or where it came from."

Then in September astronomers J. Grindlay and J. Heise, working with the Dutch astronomy satellite, reported intense bursts of x-rays coming from a "globular cluster" in the constellation Sagittarius.

(Globular clusters are clusters of about a million billion stars; four such globular clusters are known to emit x-rays. Some physicists believe the x-rays may be evidence of a "black hole" in the center of the cluster.)

After the September announcement, MIT physicists looked back over their data and detected the strange repeating character of the bursts. They have also pointed SAS-3 at the apparent source of the bursts, to study them further.

If the source is in the globular cluster, Professor Clark said, the intensity of the x-ray burst is a million

times the intensity of all radiation from the sun.

Regularly repeating bursts of x-rays are normally thought to be produced either by a pulsing object or by a rotating object (like a beacon emitted by a rotating lighthouse).

But the "phase jitter" and the big difference between the duration of the bursts and the interval between bursts puzzle physicists. Professor Clark said that it is hard to understand how the bursts could be produced either by a rotating or a pulsating object.

"Our position is just that we do see regularly recurrent bursts from this region of the sky, and that we are not certain what the origin is," he said.

The first nonsolar source of x-rays (waves like radio waves or light waves, but with a shorter wavelength) was discovered only about 13 years ago. Since then progress in x-ray astronomy has been rapid, despite the necessity of using rockets, satellites or balloons to lift x-ray detectors above the curtain of the earth's atmosphere.

Scores of students, technicians, and researchers at MIT have contributed to the construction and operation of SAS-3, as well as to the analysis of the data radioed back to earth from its detectors.

The co-investigators on the project are Professors Hale Bradt, Walter H.G. Lewin and Saul A. Rappaport, of the Department of Physics and Center for Space Research, and Dr. Herbert H. Schnopper, formerly at MIT, and now at the Center for Astrophysics at Harvard University.

# Mexican Alumni Hold Conference

Chancellor Paul E. Gray and four MIT professors at the Alfred P. Sloan School of Management were recently in Mexico City where they participated in a two-day regional conference on management in a developing technology co-sponsored by the MIT Club of Mexico and Bancos de Comercio S.A. of Mexico.

Participating with Dr. Gray were Dr. Arnoldo C. Hax, associate professor of management science; Dr. Edgar H. Schein, professor of organizational psychology and management; Dr. Donald R. Lessard, assistant professor of management, and Dr. Henry D. Jacoby, professor of management.

Dr. Gray delivered the keynote address. Professor Hax discussed planning and control systems to support management decisions. Professor Schein addressed behavioral science and organization. Professor Lessard spoke on capital budgeting and investment decision, and Professor Jacoby discussed the world oil market.

Tech Talk, February 4, 1976, Page 3



# February 4 through February 15

#### Seminars and Lectures

#### Wednesday, February 4

Integrational Malnutrition and Behavior\* – Janina Galler, research associate, nutrition & food science. Nutrition & Food Science Seminar. 9am, Rm E18-408.

Coastal Upwelling and Coastally Trapped Waves\* – Allan Clarke, earth & planetary sciences. Oceanography Sack Lunch Seminar. 12n, Rm 54-311. Bring lunch, coffee available.

The Kibbutz - An Alternative Way of Living\* - Yosef Yassour, coordinator of kibbutz affairs, HBS student. Israeli-American Forum. 8:30pm, Stu Ctr West Lge. Refreshments.

#### Thursday, February 5

Introduction to Seminar: Materials Resource Policy\* – Michael B. Bever, materials science & engineering, and Joel P. Clark, materials systems. First in a series of seminars. 3pm, Rm 13-5101.

Informal Discussion About Current Developments in Congress\* – Michael Pertschuk, chief counsel for Senate Commerce Committee. Political Science Seminar. 3:30pm, Rm E53-482.

Organizational Meeting\* – Nuclear Engineering Energy Assessment Group Seminar. 4pm, Rm 24-115.

Flame Quenching in Internal Combustion Engines\* - Colin Ferguson, G. Thermal-Fluids Seminar. 4pm, Rm 3-343.

Romantic Ideas and the Revolution in European Consciousness\*\* – Sir Isaiah Berlin, Fellow of All Souls College, Oxford; president, British Academy of Arts and Sciences. Humanitas: An Evolving Perspective Seminar on Technology and Culture. 4pm, Rm 9-150.

The MIT Model for Nucleon Structure\* - Kenneth A. Johnson, physics. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm, Rm 26-110.

Giant Mind Users Group\*\* - Meeting 7pm, Rm 36-155.

#### Friday, February 6

Child Care and Social Services On and Off Campus\*\* – Margaret Sand, Child Care Office; Myra Rodriquez, social worker, medical. Being a Minority Employee and Student at MIT (361b). 12n, Rm 10-105. Note change in topic and room.

Mathematical Modeling of Photochemical Air Pollution – John H. Seinfeld, chairman, of chemical engineering, California Institute of Technology. Chemical Engineering Seminar. 2pm, Rm 10-105.

Charge Density Waves\* - T. M. Rice, Bell Labs, Murray Hill, NJ. Materials Science Colloquium. 4pm, Rm 9-150. Tea 3:30pm.

## Monday, February 9

Migration, Economic Growth and National Planning\* – Michael Caramanis, G, Harvard University. Migration & Development Study Group Seminar, CIS. 1pm, Rm E53-482.

A Legislator's View of the Nuclear Power Issue\* - State Representative Carol Amick. Nuclear Engineering Seminar. 4pm, Rm NW12-222. Refreshments 3:30pm.

Diel Rythms in Phytoplankton Populations\* - Sallie Chisholm, Scripps Institution of Oceanography. Water Resources and Environmental Engineering Seminar. 4pm, Rm 48-316. Coffee 3:45pm, Rm 48-410.

White Noise vs. Wiener Process Models in Filtering and Control\* – A. V. Balakrishnan, electrical engineering, UCLA. EE & CS Control Communications Seminar. 4pm, Rm 39-500.

Material-Process Interaction, During High Speed Twist Texturing of Thermo-Plastic Yarns\* – Stanley Backer, mechanical engineering. Mechanical Engineering Seminar on Mechanics of Materials. 4pm, Rm 3-133. Coffee 3:30pm, Rm 1-114.

A Numerical Scheme to Solve Unstable Boundary Value Problems — Eugenia Rivas, meteorology. Applied Mathematics Seminar. 4pm, Rm 2-338. Coffee 3:30pm, Rm 2-349.

# Tuesday, February 10

The Case of US Steel\*\* - Kathy Stone, labor historian, editor of *The People's Voice* newspaper, Somerville. Seminar on Technology, Merit & Equality. 12n, Stu Ctr Mezzanine Lge.

Nothing is Ever the Way it Appears to Be (Angola)\* - Clyde Ferguson, Harvard Law School. MIT-Harvard Joint Africa Luncheon Seminar. 12:30pm, Rm I, HCFIA, 6 Divinity Ave.

VI-A Orientation Lecture – For sophomores interested in entering EE&CS VI-A program. Students currently in program and faculty advisors available for discussion. 3pm, Rm 10-250.

Some Recent Applications of Digital Guidance and Control on Aerospace Vehicles\* – B. M. Hall, branch chief, guidance & control, McDonnell Douglas Astronatuics Co. Aero/Astro General Seminar. 4pm, Rm 35-225. Coffee 3:30pm, Rm 33-222.

The Newspaper Systems Development Group's (NSDG) Full Page Composition System\* - Robert M. Elkin, Minneapolis Star and

Tribune. Gannett Newspaper Technology Seminar. 4pm, Rm 10-105.

#### Wednesday, February 11

Computations of Surface Energy Flux and Annual Air-Sea Interaction Cycles of the North Atlantic Ocean\* – Andrew Bunker, WHOI. Oceanography Sack Lunch Seminar. 12n, Rm 54-311. Bring lunch, coffee available.

Amino Acid Compartmentation and the Diurnal Changes of Protein Turnover in Rat Liver\* – E. A. Khairallah, biochemistry, University of Connecticut. Nutrition & Food Science Seminar. 3pm, Rm 16-139

Ten Years of SALT\*\* - Paul Nitze, former member of US SALT delegation. MIT-Harvard Arms Control Seminar. 4pm, Rm I, HCFIA, 6 Divinity Ave.

Genetic Screening Technology and Legislation\* – P. Reilly, M.D., postdoctoral fellow in medical genetics, Texas Medical Center. Technology Studies Seminar. 4pm, Rm 20D-205. Coffee 3:30pm.

Utilization of the Instrumented Impact Test for Evaluating Dynamic Fracture Instability\* — Ben Z. Weiss, materials engineering, Technion-Israel Institute of Technology, Haifa, Israel. Materials Science & Engineering Seminar. 4pm, Rm 4-145. Tea 3:30pm, Rm 8-314

The Middle East Conflict: Additional Point of View\* - Ben Nitay, G. Israeli-American Forum. 8:30pm, Stu Ctr Mezzanine Lge. Refreshments.

## Thursday, February 12

Opportunities for Process Optimization in the Steel Industry\* – Julian Szekely, materials engineering. Materials Resource Policy Seminar. 8pm, Rm 13-5101.

Formation of an Omega-Phase from Alpha-Titanium (Fe) During Aging\* - Ben Z. Weiss, materials engineering, Technion-Israel Institute of Technology, Haifa, Israel. Materials Science & Engineering Seminar. 4pm, Rm 4-145. Tea 3:30pm, Rm 8-314.

STOIC: STack Oriented Interactive Compiler – A Programming System for Microprocessors\* – Jonathan M. Sachs, Biomedical Engineering Center, HST. Biomedical Engineering Center for Clinical Instrumentation Seminar. 4pm, Rm 36-428.

Heat Pumps\* – Leon Glicksman, lecturer, mechanical engineering Nuclear Engineering Energy Assessment Group Seminar. 4pm, Rm 24-115.

Metal Working Application of High Power CO<sub>2</sub> Lasers\* - Richard Patrick, vice president for advanced products, AVCO Everett Research Laboratory. Thermal-Fluids Seminar. 4pm, Rm 3-343.

Measuring the Charge of the Quark\* - Louis J. Osborne, physics. Physics Colloquium. 4:15pm, Rm 26-100. Refreshments 3:45pm, Rm 26-110.

#### Friday, February 13

Migrant Workers and the Development of Yugoslavia\* – Ivo Baucic, Center for Migration Studies, University of Zagreb. CIS Migration & Development Study Group Seminar. 1pm, Rm E53-482.

The Pathophysiological and Biochemical Effects of the Very Long Monoenoic Fatty Acids: A Difficult Nutritional Problem and a Tool for Studying Fat Metabolism\* – Dr. A. J. Vergrosoesen, Unilever Research, Vlaardingen, the Netherlands. Nutrition & Food Science Special Seminar. 2pm, Rm 26-168.

The American Productivity System, Who's in Charge Here?\* – Frederick Haynes, assistant director of logistics & communication, General Accounting Office, Washington, DC. Mechanical Engineering Seminar. 3pm, Rm 3-133.

## **Community Meetings**

MIT Space Habitat Study Group\* — First meeting of spring semester will be an informal get-together with discussion of workshops & papers to be presented at May conference. Anyone interested invited. Wed, Feb 4, 7:30pm, Rm 24-407.

Campaign '76\* – Morris K. Udall, Democratic presidential candidate, will speak and answer questions. Sponsored by Lecture Series Committee. Wed, Feb 4, 8pm, Sala. Organizational meeting will follow.

Women and Minorities Open House\*\* - Sponsored by Department of Ocean Engineering. Organized by Wesley Harris, ocean engineering, aero/astro; Judity Kildow, ocean policy; & Norman Jones, ocean engineering. Thurs, Feb 5, 3pm, Rm 5-314. Refreshments.

MIT Students' Federal Credit Union — Short meeting of students interested in forming a credit union. Thurs, Feb 5, 5pm, Rm 8-105. A Federal Credit Union is similar to a savings bank that makes loans to students and alumni, and has depository accounts insured to \$40,000 by FDIC. Call David Hoicka, x5-9649 Dorm for info or if can't attend

The Vegetarian Community Dinner – Bring your own dinner to the Community's first meeting. Tues, Feb 10, 5-6:30pm, Stu Ctr West Lge. Info: x5-7403 Dorm, or x3-4170.

International Cooking — Sponsored by TWO. Toni Alva, from Peru, will be cooking for us Wed, Feb 11, 8pm, Rm 10-340. Members \$.50, non-members \$.75. Info: Judy Cooper, 625-1062 or Jenny Gordon, 547-6471.

MIT Women's Forum\*\* - Meetings Mon, 12n Rm 10-105 (Tues in case of holiday.) Mon, Feb 9: Mary P. Rowe, special assistant to president & chancellor for women and work, will speak on "Women in Russia".

The Wives' Discussion Group\*\* – Led by Myra Rodriques, social worker; Charlotte Schwartz, sociologist; & Carol Hulsizer, faculty family in residence, Ashdown. Wed, 2:15pm, Stu Ctr West Lge. Babysitting Stu Ctr Rm 473.

MIT Diet Workshop\*\* - Thurs, 12n-1pm, Stu Ctr Rm 491.

## **Social Events**

Coffee House Revival\* - Sponsored by MIT Hillel. Sun, Feb 8, 7pm, Hillel bsmnt. Refreshments.



The two women above seem to be enjoying a following wind-heading into it wasn't such fun for the one below.



MIT Buddhist Association\* — Informal discussion and refreshments. Sun, Feb 8, 3pm, Stu Ctr West Lge. All are welcome. Info: x5-7265 Dorm.

24 Hour Coffeehouse\* — Enjoy relaxing conversation, piano playing, inexpensive food, candy & drinks. Open 24 hours per day, 7 days per week, Stu Ctr 2nd fl lge.

# Movies

Monty Python and the Holy Grail\*\* - LSC. Fri, Feb 6, 7 & 9:30pm, Kresge. Admission \$.75. ID required.

Saturday Night and Sunday Morning\* - MIT Film Society. Fri, Feb 6, 7:30 & 9:35pm, Rm 6-120. Admission \$1.

Films on New China: Seven Chinese Festivals; This Land, This People\* - MIT Chinese Students' Club. Sat, Feb 7, 2pm, Rm 10-250. Free.

French Connection II\*\* - LSC. Sat, Feb 7, 7 & 10pm, Kresge. Admission \$.75, ID required.

Mahal (Kamal Amrohi)\* - Sangam. Indian movie with English subtitles. Sun, Feb 8, 2:30pm, Rm 26-100. Admission \$.50 with ID. Indian refreshments. Info: x5-7469 Dorm.

Gunga Din\*\* - LSC. Sun, Feb 8, 6:30 & 9pm, Rm 26-100. Admission \$.75, ID required.

Operation Sail '76\*\* - MIT Nautical Association. Color film on gathering of "Tall Ships" to observe Bicentennial. Fri, Feb 13, 7pm, Rm 4-270. Free.

Red Psalm (Jancso)\* - MIT Film Society. Fri, Feb 13, 7:30 & 9:30pm; Rm 6-120. Admission \$1.

## **Lobby 7 Events**

Ken Quat Trio\* - Medieval and Renaissance consort. Wed, Feb 4, 12n, Bldg 7 Lobby. Free.

Impulse Dance Group\* - Wed, Feb 11, 12n, Bldg 7 Lobby. Free.

MIT Shakespeare Ensemble\* - Scenes from Richard III, Julius Caesar, Romeo & Juliet, Henry IV part 1, and Love's Labors Lost. Thurs, Feb 12, 12n, Bldg 7 Lobby. Free.

## Music

Chamber Music Society concerts\* - Wed, 5:15pm, music library Bldg 14E. Free. Info: x3-4892.

## **Theater and Shows**

Musical Theatre Guild Auditions\* — Auditions for spring production of Fiddler on the Roof will be Sat, Feb 7, 12n-4pm; Sun & Mon, Feb 8 & 9, 7-10pm; all Stu Ctr Mezzanine Lge.

The Alchemist\* - MIT Dramashop production. Fri & Sat, Feb 6-7

and Thurs-Sat, Feb 12-14, 8pm, Kresge Little Theatre. Admission

#### Dance

Beginning Waltz Workshop\* - MIT Ballroom Dance Club. Sun, Feb 8, 2-5pm, Sala. All are welcome. Info: Sharon, x5-8667 Dorm.

Hatha Yoga\* - Mon, Feb 9: intermediate 5:45pm, beginners 7:05pm; Tues, Feb 10: beginner-intermediate 5:45pm; Fri, Feb 6 & 13: over 40, 10:30am; all Rm 10-340. Ilene Turchinetz, 862-2613.

MIT Folk Dance Club - International: Sun, 7:30-11pm, Sala. Balkan: Tues, 7:30-11pm, Stu Ctr 491. Informal: Fri, 12n-1:30pm, Bldg 7 Lobby. Israeli: Thurs, 7:30-11pm, Sala.

#### **Exhibitions**

A Summer House\* - Results of the 2 week IAP architectural design studio course taught to employees by Jan Wampler. Models and plans on display in Rotch Library, Rm 7-238, thru Fri, Feb 13.

Claes Oldenburg Exhibition - Sponsored by Committee on the Visual Arts and Institute for Contemporary Art. Thru Wed, Feb 25, Hayden Gallery. Hours: 10am-4pm daily, 6-9pm Tues. Opening reception Fri, Jan 16, 8-11pm.

Amenoff Exhibition\* - Drawings and paintings on paper, by Gregory Amenoff. Thru Wed, Feb 25, Hayden Corridor Gallery. Photographs of the Ozarks\* - Works by Roger Minick. Thru Fri,

Feb 27, 10am-10pm, Creative Photography Gallery. Oil Paintings by Marsha Blakemore\* - Faculty Club Exhibit. During

MIT Historical Collections\* - Permanent exhibition Mon-Fri, 9am-5pm, Bldg N52, 2nd floor. Bicentennial Exhibits: Katharine Dexter McCormick, '04; Vannevar Bush, '16; and Karl Taylor Compton, in Bldg 4 corridor.

Schumann at Work on a Song\* - Music Library exhibit of manuscript facsimiles & pictures. Daily, Bldg 14E.

Hart Hautical Museum\* - Permanent exhibit of rigged merchant and naval ship models, half models of yachts and engine models. Open daily in Bldg 5, 1st floor.

## **Athletics**

Feb, Faculty Club.

Home Schedule\* - Wednesday, February 4 - V Hockey. Tufts, 7pm, rink. V Rifle. Tabor Academy, 4pm, duPont Rifle Range. Thursday, February 5 - JV/F Wrestling. Emerson, 7:30pm, duPont

Wrestling Rm. Saturday, February 7 - JV/F, V Basketball. Clark, 6:15 & 8:15pm, Rockwell Cage. JV/F Hockey. Graham (host), 2pm, rink. V Squash. Fordham, 2pm, duPont Squash Courts. JV/F Squash. Colby, 2pm, duPont Squash Courts. Tuesday, February 10 V Basketball. Nichols, Spm, Rockwell Cage. W (JV) & W Basketball. Radcliffe, 4 & 6pm, Rockwell Cage. V Squash. Williams, 4pm, Bowdoin, 7pm, duPont Squash Courts. Wednesday, February 11 - V Hockey. Bunker Hill CC (host), 7pm, rink. Thursday, February 12 - W. Fencing, Radcliffe, 7pm, duPont Fencing Rm. JV/F Hockey. Emerson, 7pm, rink. V Rifle, Northeastern, 4pm, duPont Rifle Range. Friday, February 13 - V Basketball. Bowdoin, 7:30pm, Rockwell Cage. V Hockey. Clark, 7pm, rink. Saturday, February 14 - W Gymnastics. Mt Holyoke, Radcliffe, 2pm, duPont Gym. V Swimming. Babson, 2pm, Alumni Pool. V Wrestling. Tufts, Boston State, 2pm, duPont Wrestling Rm.

Freshmen are encouraged to attend departmental lectures and seminars. Even when these are highly technical they provide students one means to learn more about professional work in a department and field.

\*Open to the public

\*\*Open to the MIT community only

\*\*\*Open to members only

Send notices for February 11 through February 22 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, February 6.

# AAAS to Devote Session To Women in Science

changes for women in science and engineering will be the theme of a special women's session of the American Association for the Advancement of Science (AAAS) meeting Monday, Feb. 23, in the Sheraton-Boston Hotel.

Of the nine scheduled panelists at "Bicentennial Retrospectives and Prospectives: Opportunities for Women in Science and Engineering," three will be MIT professors: Mildred Dresselhaus of the Department of Electrical Engineering and Computer Science; Vera Kistiakowsky of the Department of Physics; and Phyllis Wallace of the Sloan School of Management. Mary Bunting, president emeritus of Radcliffe College, will preside at the all-day symposium, which was arranged by Professor Miriam Schweber of Simmons College.

The dates for other AAAS symposia are Feb. 18-24.

Professor Dresselhaus, who will also be participating in a session on "Great Women in Science," will offer "Views on Undergraduate Education for Women in Science and Engineering" during the morning part of the February 23 symposium.

She will discuss some of the psychological barriers women students face in the male-dominated worlds of science and engineering. Dr. Dresselhaus believes that because of the greater demands on the average woman professional with a family, university administrations should provide women students with the best possible professional training so that they can continue their research in later life and still meet domestic responsibilities.

Professor Kistiakowsky, speaking in a session beginning at 3pm, will focus on historical changes in the status quo of women over the past 200 years. Comparing the percentages of women scientists in various fields from the 1920s to today, she contends that we are in the midst of a teminist wave that will signal

more women doctoral scientists. In the "Prospectives" part of the program, focusing on the problems still to be faced by women trained in science and engineering, Professor Wallace of the Sloan School of Management will discuss "Future Employment Opportunities for Women in Science and Engineering."

Other women who will be speaking at the special session are: Patricia Graham, dean of the Radcliffe Institute and a professor of education at Harvard; Mary Verheyden-Hilliard, director of the Sex Equality in Guidance Project of the American Guidance and Personnel Association in Washington, D.C.; Elizabeth Baranger, director of graduate programs and professor of physics at the University of Pittsburgh; Virginia Trotter. Assistant Secretary for Educa-

A 200-year history of educational tion in the US Department of Health, Education and Welfare; Joan B. Berkowitz, senior staff scientist for Arthur D. Little, Inc., and Betty Vetter, executive director of the Scientific Manpower Commission in Washington.

# 2 Promoted In Resource Planning

Planning, Joseph G. Carr, senior staff writer, and Deborah J. Cohen, assistant staff writer, have had their responsibilities expanded, according to an announcement this week by Nelson C. Lees, director.

Mr. Carr, while continuing his writing duties, has been named manager of the Proposals and Publications Group and will assume full administrative responsibility for it. The group is responsible for preparing all written material in support of MIT's overall development operation, and one of its major tasks is preparation of publications related to MIT's \$225-million Leadership Campaign.

Mr. Carr came to MIT in the fall of 1972 as a staff writer for Resource

Development. His background is in teaching and journalism with experias staff editor in the Office of Foundation and Government Relations at Boston University. He

received the BA degree in 1967 from Manhattan College and the MA in 1969 from the University of Wiscon-

Ms. Cohen, who has been promoted

writer, will add to her regular writing assignments editing the MIT Lead-Campaign Newsletter. Before joining the Resource Development staff in 1974 she was a



research assistant for the Education Development Center in Newton, and for Mayor Kevin White's Committee on the Urban University. From 1971-72 she was a high school teacher in Western Galilee, Israel. She holds an AB degree ('69) from Cornell University and an MA (1971) from Tufts University.

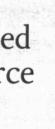
AAAS Concert Tickets on Sale

Tickets for two concerts to be held during the annual meeting of the American Association for the Advancement of Science, Feb. 18-24, are available at the TCA Student Center Office, Rm 450, x3-4885

-Boston Pops Concert, Arthur Fiedler conducting, Friday, Feb. 20, 8:30pm, Symphony Hall. Floor and first balcony, \$6.50; second balcony, \$4.50.

-New England Conservatory Ragtime Ensemble, playing music of Scott Joplin, Sunday, Feb. 22, 2:15pm, John Hancock Hall. All seats \$3. Free parking

There is a 25-cent handling charge for TCA ticket orders.



Two staff members of Resource



from assistant to associate staff

"The publicity and excitement of last year's tournament generated a lot of enthusiasm for women's sports at MIT," Professor Mary Lou Sayles, director of women's athletics, said. "Nationally, people are more aware of women at MIT because of women's sports."

Professor Sayles will accompany

# Flierl Appointed In Meteorology

Glenn R. Flierl has been appointed an assistant professor in the MIT Department of Meteorology for three years beginning July 1, 1976.

Professor Flierl received his BA with highest honors in physics from Oberlin College in 1970 and his PhD in physics from Harvard University in 1975. He has co-authored several articles that have appeared in professional journals.



Ready to swing into action on the basketball court are (left to right) Beverly Herbert, Diane Ozelius, Lynne Richardson, Sheila Luster and Patricia Schettig, five

members of the MIT Women's Varsity Basketball Team who will compete in the University of Chicago Invitational Basketball Tournament Feb. 6-7.

# Women Hoopsters to Vie in Chicago

16.6 points per game.

program

sports.

the team to Chicago and will be a

participant in a WGN radio talk show

The team, one of five women's var-

sity sports at MIT, enters the tourna-

ment with a record of 5-3. Leading

scorer is Diane Ozelius, averaging

Team members participating in

the tournament are captain Beverly

Herbert, a senior in urban studies

and planning from Dorchester,

Mass.; Lisa Jablonski, a junior in

humanities and science from Lowell,

Mass.; Debra Luehrs, a junior in life

sciences from Jackson, N.J.; Sheila

Luster, a sophomore in civil engi-

neering from Camp Springs, Md.;

discussing women in

The MIT Women's Varsity Basketball Team departs Thursday (Feb. 5) for Chicago, where it will compete in the University of Chicago Invitational Basketball Round-Robin Tournament on Feb. 6-7.

The MIT team will play the women's basketball teams of Oberlin College, the University of Chicago, Northwestern University and Brown University.

While in Chicago team members will meet with Chicago area alumni at a luncheon to which prospective women students have been invited. Team members plan to use this opportunity to inform potential students about the Institute and, in particular, about women's sports.

Team members raised \$900 to defray expenses by selling T-shirts and buttons promoting women's athletics. Gifts were also received from the MIT Alumni Association, Women's League and Athletic Department.

ago MIT initiated its first Women's Invitational Basketball Tournament won by Brown over Radcliffe, MIT and the University of Chicago.

ment Group's full-page composition system will be the subject of the Gannett Newspaper Seminar Tuesday, Feb. 10, at 4pm in the Bush Room, 10-105. The seminar speaker will be Robert M. Elkin, a staff member at the Minneapolis Star and Tribune and graduate of MIT in 1974 with SB degrees in electrical engi-

ready for publication.

teractive, integrated system.

The NSDG system consists of a host computer, a number of specialJenny McFarland, a sophomore in aeronautics and astronautics from Hubbard, Ore.; Diane Ozelius, a freshman from Brockton, Mass.; Lynne Richardson, a senior in life sciences from New York, N.Y.; Patricia Schettig, a senior in life sciences from Nyack, N.Y.; Ellen Scotti, a senior in mechanical engineering and management from E. Greenwich, R.I.; Christine Tracey, a senior in electrical engineering from Seattle, Wash., and Linda Yester, a senior in mathematics from Mt. Prospect, Ill.

Team manager is Caren Penso, a junior in economics from Marlboro, N.J., and the coach is Ross Hunter (MIT '69) of Brookline, Mass.

# Full-page Composition To Be Seminar Subject

The Newspaper Systems Developneering and management.

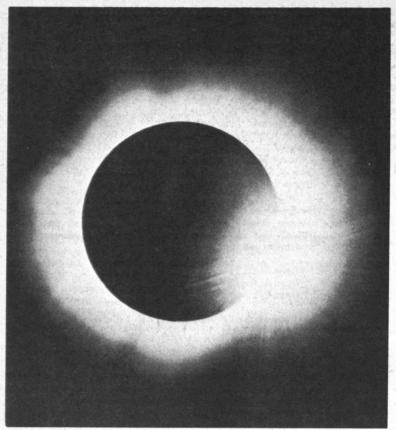
The Newspaper Systems Development Group (NSDG) is a consortium of eight newspaper companies that have been working together for over four years to develop a full-page composition system capable of processing classified advertising, display advertising and editorial matter, and electronically assembling these components, including graphics, into complete newspaper pages

The NSDG concept is that the most effective way to produce full newspaper pages is to assemble all of the elements through use of a single in-

ized intelligent terminals and other minicomputer-driven electronic devices. These include optical character readers, data entry and textedit terminals, composition-andmakeup terminals, graphic scanners, and on-line high-speed photocomposers. The software includes a powerful data-base/data-communications system. The applications software is structured into four functionally oriented subsystems: news, classified, display, and layout and composition. A production-control "subsystem" provides facilities to monitor and control work in progress.

In the seminar, which is open to the public, Elkin will explain details of the various subsystems and the operating system as a whole. The seminar is the seventh in a series of 12 being offered over a three-year period through a grant from the Frank E. Gannett Newspaper Foun-

Tech Talk, February 4, 1976, Page 5



Four new posters, including the one above of a total solar eclipse March 7, 1970, will be on sale next week, Monday through Friday from noon-2pm in the Building 7 Lobby. The full color posters were photographed by the Kitt Peak National Observatory in Tucson, Ariz. Posters will be sold in sets of four for \$5, with all proceeds to benefit the MIT Community Service Fund.

# **Economic Problems End** Citicorp Solar Experiment

An experiment to use solar energy and a chemical dehumidifier to conserve energy and reduce air conditioning costs for the Citicorp Center Building in midtown Manhattan has been dropped for economic reasons, it was announced Feb. 3. The announcement was made by the parties to the project, the Energy Research and Development Administration (ERDA), the National Science Foundation, the First National City Corporation of New York City and MIT.

It was found that substantial energy savings could be made by changing the standard air conditioning system and that this significantly reduced the potential energy savings available from the solar dehumidification system.

In many large buildings, such as the Citicorp Center, it is common practice to overcool outside air to remove humidity and, then, to reheat the air to a comfortable level before introduction into the rooms of the building. In the solar experiment, the need to overcool was to be eliminated. The system air would have been dehumidified by spraying the intake air with triethelyne glycol. Solar heat, collected by panels on the roof, would have been used to remove the moisture from the liquid triethelyne glycol for reuse.

It had been estimated in a preliminary study jointly funded by Citicorp, Consolidated Edison of New York and MIT, that the solar dehumidifying system would save the building operators \$50,000 a year in energy costs, which would allow the system to repay its expected \$1 million cost within a reasonable time.

Engineers for Citicorp however, found they could eliminate a need for overcooling and achieve substantial energy savings by reducing the flow rate of conditioned air.

While the solar dehumidifier could still save nearly \$20,000 a year over the modified conventional system, annual operation and maintenance cost estimates reduced these savings to only \$3,000 a year. It was felt that this small cost savings was not sufficient to justify the high initial installation expense, particularly since it would not result in a significant additional energy cost savings.

The MIT Energy Laboratory, in cooperation with Loring/Meckler Associates of Washington, D.C., conducted a detailed design study this past year to obtain accurate projections of costs and savings for the project. This was done under a \$186,000 grant from the National Science Foundation. Had the results of this study been favorable for construction, the project was expected to be transferred to ERDA. The outcome of the study, the sponsors said, has shown the importance of careful

evaluation before proceeding with

construction.

A number of other operational and technical approaches to saving energy were suggested by the MIT researchers, some applicable whether the solar system was installed or not. Citicorp officials have expressed continuing interest in the possible application of these approaches to Citicorp Center.

The Citicorp Center, now under construction, is located at 53rd and Lexington Avenues in New York City. It is to be 914 feet high, with a sloping roof. The solar collectors could be accommodated on the slope. Citicorp had spent about \$100,000 redesigning the roof to face south for greater solar efficiency before the decision was made to discontinue the project. The option has been left open for future use of solar energy if it becomes cost effective.

# Sloan Fellow Wins Award

Dr. Robert L. Evans, dean and professor of medicine at the University of Illinois' Rockford School of Medicine, currently studying in the Sloan Fellows Program at MIT, has been named recipient of the John C. Leonard Award by the Association for Hospital Medical Education.

Dean Peter P. Gil, director of the Sloan Fellows Program, said Dr. Evans is one of seven health executives studying at the Sloan School under the MIT Health Management Executive Development Program. The program is part of the Alfred P. Sloan Fellows Program, the nation's oldest executive development program.

The health management program is aimed at mid-career health care practitioners, educators, researchers and administrators who desire an intensive management development experience in preparation for continued career growth and increased responsibility in the health field. The program is incorporated within the 44-year-old Sloan Fellows

The Leonard Award-named for the nation's first director of medical education and given for only the fourth time in the last 15 years-honors Dr. Evans for his early work while on the faculties of Jefferson and Maryland Medical Colleges and while vice president for medical affairs at York Hospital, Pennsylvania, and for his later work in guiding the nation's first medical school in which a major university-Illinoisused the practicing physicians of a community-Rockford-to plan a curriculum and teaching system. More than 70 percent of Rockford's graduates have entered family

health care practice.

# **CLASSIFIED**

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompainied by full name and Instiaccompanied by full name and Insti-tute extension. Only Institute exten-sions may be listed. Members of the community who have no extensions may submit ads by coming in person to the Tech Talk office, Room 5-111, and presenting Institute identification. Ads may be telephoned to Ext. 3-3270 or mailed to Room 5-111. Please submit all ads before noon, Friday, Februray 6. They will be printed on a first come,

# For Sale, Etc.

Bargains: rugs, crtns, blender, toaster, K cab, sgl bed, clock radio, stereo phono amfm, all gd cond; also crib, baby dresser, swingomatic. Call, 731-8048 731-8948.

Kneissl Red Star, 200 cm skis w/ Marker Rotomat bndgs, Humanic sz 9½ boots, \$60. Bob, 354-7578, evgs.

Garrard SL-95B trntbl w/base, dustcvr, nw ADC 90X crtrdg, v gd cond, \$70; 8.02 text, Purcell, Elec & Magnetism, b nw, Coop price \$7, \$5, x5-9887 Dorm, lve msg, kp try.

Wht Hyde fig skates, child sz 11, exc cond, best. x5768 Linc.

Bound copies of NY Times, June 1947, \$1; iron, \$4; end tbl, \$5; sewing tbl on whls, \$15. Robert, 494-8418, evgs.

Sgl bed, exc cond, \$40; brkn color TV, best. Terry, x3-2342.

Mtd VW snows, used 2 seas, \$30. Terry, x3-5788.

Quaker State 10W motor oil, \$.50/can; classic blk tuxedo, fits 6'2'', \$25. William Beebee, x8-3624 Draper.

Windup metronome, \$12; Go game set, \$15; classical rcrds, paperbacks, \$.50-\$1; Miranda FV SLR camera w/f1.8 lens, 135 mm & 35 mm lenses, case, other access, all \$150. x5-9864

Bean bag chr & hassock, \$15; f skates, sz 8; asst recrds. Pat, 267-5698, evgs. Henke f sz 9 ski boots, \$10: F fig skates sz 61/2, \$10. Helen, x8-3501 Draper.

Dresser, \$35; sm dresser, \$15; mirror, \$10; ice skates, sz 9, \$4. Call, 547-0565, aft 6pm.

Aircraft instruments, 3" Bendix rateof-climb indicator, 0-2000', 3'' compass & cyl head temp guage; Marker Rotomat ski bndgs w/straps. x5-9865 Dorm.

Fischer 205 cm skis w/Tirolia step-in bndgs, \$45 or best. Tom Schwartz, x3-6894.

Spaulding skis & Solomon bndgs. Steve, x5-9425 Dorm.

Clegg 66'er 6 mtr transceiver, xtal cntrl, am, w/xtals, mic, ask \$100. Pat, 661-3993, evgs.

Grn carpet, \$60 nw, \$30 or best; bike exerciser, \$10. Call, 666-5535.

Pr Pirelli radial snows, tube type, 155 SR 13, Fiat, etc. Jake, x3-6947.

Pr tckts to Fidelio, Bos Opera Co, Tues, Feb 17, evg, \$8/ea. x3-2916.

Harv Classics, compl set, \$25. Mim Rich, x3-6937.

Handyman's spec, GE 2 slice toaster, works but nds adjustment, \$3. Call,

works but nds adj 484-0802, aft 1pm. Girl sz 11 Hyde fig skates, \$5; 17" girl

bike, \$10. Terry, x3-3840.

Garrard SL 73 B trntbl, exc cond, \$40; Panasonic 8 trk tape rcrdr, v little use, \$65. Jaime, x3-6587.

Child booster chr, \$4.50; 4 k sz mtl tbls, \$5; girl dance costumes, asst sz. \$12/ea; girl tap shoes, asst sz. \$4/ea.

x8-4095 Draper.

K sz teak hdbrd w/attach end tbls & fluor lamp, \$175; wd baby dressing tbl, \$20. Call, 862-8616.

Mtl 200 cm skis, \$10; lace ski boots, m sz 10, \$5. Janis, x3-4716.

Miracord 1620 trntbl, \$40; cradle, \$20; wood, kiln-dried cherry, \$1.25/bd ft; also want frpl hardware, old, used or otherwise, cheap. x3-1916.

Ovrstuffed corduroy chr, converts to bed, b nw, Upper Story, must sell, pd \$500, best; 10 yr Kenmore washer, works, \$25. Mike, x3-6487.

Otagari covered bowls, 2, \$8/pr; fig skates, f sz 7½, \$10; wd pic frames, 16x3 20 matte, \$4; 17x21, \$4/ea; selection stainless ware. Carol, selection x3-1332.

Kitchenaide dishwash, used; used GE trash compactor; \$100/ea or best. x3-3397.

Twn bed set, box spr A-1, matt fair, \$25. x3-4679.

Pr whls for Valiant, \$10; nw 1.65x13 tire, \$15; nw trlr hitch for '71-'73 Opel, \$25. David, 646-1579.

Grn all wool 12x11' rug, used only mos, \$130. David, 646-5854.

Heathkit AD-27 compact stereo ctr, fm & BSR 510 w/roll-top cabinet, 12 W/chnl, 1½yrs, \$180 or best. Cameron, x5-9540 Dorm.

HP 21 cacl w/handbook, nw case, charger & batt, \$85 or best. Call, 646-4053.

Pr m Lange ski boots, sz 9½. Robert, x5-7387 Dorm.

Slide proj, "TDC Vivid", old but v gd, 4 trays, xtra bulb, carry case. Phil, 491-4243, evgs.

Canon TLB w/50 mm f1.8 lens, exc cond, \$100. Neal, 661-8240.

Sm Hitachi R-2061 refrig, exc cond. Tony, x5-9795 Dorm.

Ital provincial RCA console stereo, 8 spkrs, blt in revr, amfm radio, \$150 or

best. x3-7273.

Ski boots, Reiker 11 w/bckls, sz 13, \$20. Ken, x8-1581 Draper. Kneissel Wht Star 205 cm skis, nvr

used, \$50. John, x3-6933. '73 Scamper, hand top tent trlr, 3 brnr

stove, icebox, slps 8, hitch, power converter, canopy, sink, holding tank, nw spare tire, \$1,200. x3-7594. B nw contemp shower crtn, lime, yel, wht abstract flower design, \$3; 4 pc brushed alum food canister set, \$5; deep brgndy drapes, 90" L, 18" W, barely used, lk nw, \$55. x8-2577

Sony TC-377 tape deck, lk nw, orig crtn, \$310; 20 pc set Correlle china, 4 settings, unused gift in box, \$20; auto Dwell-Tach, \$15. Call, 494-0471, aft

Nw 190 cm skis, Franklin Dynalit, w/Marker M-3 bndgs, used 2X, best. Jo, x3-6746.

Professional hair blower, 2 temp, 3 spd, rec'd as gift, used 2X, \$20; snows: pr 6.45x14 Gdyr, used 1 seas, \$30; (1) 6.95x14 recap, gd tread, \$5; (1) Michelin ZX radial, 1.65x14, wire whl, \$25. Ziggy, 266-7797.

Box spr, \$15. Ellen or Janet, 254-6580, aft 7pm.

Frigidaire refrig, 17.6 cu ft, \$50. Jacob Martin, x8-1478 Draper.

Peugeot PX10 bike w/Campy front & rear derailleurs, less yr old, perf cond, Citadel lock, \$225. x5-6512 Dorm,

Zenith 19" b&w TV, mpl console. R. Strong, x8-1418 Draper.

Join Bicentennial celebration, order beaut hand-crocheted poncho, red/ wht/blu or your choice colors, \$30; mtch beret, \$2. Diane, x8-1766 Draper.

F Clark Wallabees, low shoe, sz 7N, brn leath, b nw, worn 2X, too sm, exc cond, nw \$34, \$27 or best. Lynda, 646-5235, aft 2pm.

Wall oven, counter top range & hood; crtns; drapes; crtn rods; fl bkcse. Stan,

Tiger power amp, 80 + 80 W RMS, cstm cab, \$110 or best; elec guitar, hollow body, \$75. x5-6149 Dorm.

Pr Gdyr ww 78x13 stud snows. Al,

## Vehicles

'54 Olds 88, 4 dr sed, 57 orig K, excrun cond, nw radiator & batt, perf for restoration, \$800. Cathy x3-5803.

'67 Ford wgn, 87 K, runs gd, tuned up, best. Frank G, x8-3632 Draper.

'67 Saab, oil inj 2 stroke w/triple carbs, eng gd but car getting old, nds minor repair, for parts or repair. Mike,

<sup>3</sup>68 Impala, AC, p st, 4 dr, snows, no rust, v gd cond, \$1,000 or best. Francois, 494-8741.

'68 Olds Cutlass, 350-2, 4 spd std, nw clutch, amfm, gd tires, \$500 firm. Pat,

'68 Caddy, 4 dr sed de ville, nw muff sys & front end job, exc run cond, \$700. John, x276 Linc, lve msg.

'68 Volvo 142S, 75 K, recent brake ovrhl, nw muff, V joints, water pump, exc run cond, \$975. R. Taylor,

'71 VW Superbeetle, nw tires, amfm 8 trk, exc cond, \$1,500 or best. Call, 354-7901, evgs.

'71 Pont Firebird Esprit 350, stl radials, mags, amfm, Sony TC-10 cassette, exc cond, \$1,900. Yum,

'72 Buick Centurion, full power, AC, amfm stereo w/tape deck, 43 K, best reas. x3-2772.

'72 Mustang Grande, exc cond, 32 K, gd tires, brakes, p st & br, blu, vinyl roof, best. x3-3312.

'72 AMC Hornet sportabout wgn, auto, 6 cyl, 24 K, \$2,000. Tom, x3-6291.

'74 VW superbeetle, exc cond, nw tires, amfm, \$2,700 or best. Call, 924-1441, evgs.

'74 Volvo 142S, 21 K, immaculate, perf cond, must sell. x3-3842.

'74 Vega wgn, 4 spd, radials, amfm & tape deck, exc cond, \$2,650. Walter, x3-2458

'74 Maverick, 2 dr, blu, wht pin stripe, auto, p st, 17 K, \$2,495. x8-2995 Draper.

'74 Datsun 610 sed, 4 spd, vinyl roof, 29 K, amfm stereo, nw disc brakes, exc cond, great buy, \$2,300 or best. x3-2807.

'75 VW beetle, must sell, 2nd car, 6 mos; also wht fig skates, f sz 9, worn once, \$15. Natalie, x3-6430.

'75 VW la Grande Bug, amfm, stereo cassette, 8 K, sunrf, nice int, wrnty, \$3,500. Bonnie, 326-3596.

'75 Honda XR75, exc cond, runs lk nw, just tuned, \$390 or best. Wally, x8-4567 Draper.

# Housing

Lex contemp 5 BR, 2 B, LR, DR, K, fam rm, perf cond, spectacular setting, Estabrook Sch district, hi 70's. Call, 861-9491.

Back Bay, mod BR apt, \$175 incl ht, hot wtr. Call, 266-3973.

Belmont, 5 rm semi-furn apt, sub 3/15-5/30 or 6/30, \$200 + util, nego. Ray Jackendoff, x3-3221.

Camb, Mass Ave btwn H & Cent Sq, nice brite rm for f, full use K, DR, B, \$100 incl util. Gladys, x3-5656.

Camb, Mass Ave btwn Harv & MIT, mod BR apt, lg, util in K, dw, lg bale, priv indr garage, lndry rm, storage rm, avail 2/1, \$320 inel ht. x3-4207.

Chelsea, exc Wdlawn sect, 4 rm unfurn apt, no pets, patio yard, sec dept & refs reqd, \$200 + elec. Angelo, x5437 Linc.

Menemsha, Martha's Vineyard, sm cottage for 3, tranquil setting on pond, a vail 6/1-6/15, \$125/wk. Alice, x3-4897.

Apts, 11/2-3 BR, bike or walk to MIT, MIT afil only. John J. Vincent, agent for Northgate Cmnty Corp, 876-9442.

#### Animals

Abandoned blk f cat nds home, about yrs, v frightened. Steve, x5-6655

Irish setter pups, m. John, x3-6418.

Big kitten, approx 5 mos, f, ginger & wht, litter trained, unable to keep due to allergy. Jane, 354-3405, aft 7pm.

Ownr w/allergy parting w/beaut cat, 18 mos, spayed m, gray w/beaut markings, thick coat, cln affectionate, trained, no trouble. John Leary, x3-2375.

#### Lost and Found

Lost: lg left hand blk ski glove w/deerskin inside, Sat, Jan 24. Call, 494-0060, evgs.

## Wanted

Used piano. Liz, x3-4904.

Flute for beginner, reas gd cond. Geri, x3-6903.

DR tbl, chrs, wd finish, reas gd cond, colonial style pref. Robin, 729-9114,

Ride to NYC wknd of Feb 27, wl share exp, lve Fri, rtn Sun. Wendy, x3-7402. Metal detector for few hours, wl pay. Dick, x3-1639, lve msg.

Sr hse residents, 2, desperate for used refrig. Kathleen or Meri, x5-6685 Sewing mach, less than \$20. Charo,

864-1595. Equalizer for Bose spkrs. Call, 876-8641.

Parallel ruler & adj triangle architectural drafting. Ruth, x5-8316 Dorm, evgs.

Marvel comics & sci fiction books, also Arkham hse books. Peter DeForest, x5-9490 Dorm. M ice skates, sz 81/2. Dan, x5-9857

Tutor for 6.071 & 6.012, spr sem, 8 hrs/wk, \$100/mo. Fac-Stu E Program, 10am-1pm, M-F, x3-5344.

Child care in my Arl home, 8am-12n, 7 dys/wk. Raquel, 641-0258.

Used Revox A77 2 trk 7½ & 15 ips tape deck; 1 or 2 used AR amps; nego. Ken, 646-3427, evgs/wknds.

Areca palm, about 3' tall; etagere, wd or glass & chrome; Instamatic camera. Mehta, x3-1550.

## Roommates

Rmmates, 2 f, nded for 5 BR Cambport hse w/swim pool, 5 min Mass Ave T. Lon, 868-7543, 5-10pm.

\$20 reward for taking my space in Ashdown, your choice of avail rms thru my seniority. Chip Sloan, thru my 729-7584.

Rms avail in lovely hse, share common rms, has frpl, grand piano, grdn, terrace, garage, woods, 15-20 min MIT, rent arranged. Call, 484-6833.

Own rm in sunny Bri apt w/4 lg rms & porch, working or grad stu, pref f, nr T, \$105 incl ht. Lisa or Bonnie, 787-3187, evgs.

Camb BR in roomy 3 BR apt avail now, K, LR, \$70 incl util. Ken or Rob, 547-2416, lve msg.

F age 26-30 to share mod, AC, 2 BR Newton apt w/tennis ct, pool, free pkg, nr T, Rt 9, 128 & Pike, \$152 + util.

Call. 964-5892. Lg sunny apt w/4 BR, dynamic extended family looking for rmmate, off Huron nr bus, own rm away from street, \$100. Call, 354-6399.

Rmmate to share 3 BR apt w/2 m, 1 straight, 1 not, MIT affil, 5 min MIT, \$107 incl all util. Harry or Dom,

## Carpools

Ride nded, Wakefield-MIT, hrs flex, pref daily but wl consider part time. Marylou, x3-7934.

WI take riders Arl, Som, Camb to Draper & MIT, 7:30-4:30. Bill, Draper & MI x8-3456 Draper.

## Miscellaneous

Typing w/editing done, anything, effic MIT wife. Mike Flynn, x3-6275.

Stat & tech typing on IBM Selec, theses, term papers. Myra, x3-1609. Interested in using nwly developed Si

photodetector w/v high response in the blue-UV region? x3-6832. Austrian girl, 17, wd like to spend 1

mo w/Amer family this summer, pref w/chldrn same age, exch also psbl. Call,

Thesis, paper, etc typing, exc typist, reas rates. Martha, 628-3782, aft 6pm.

# **POSITIONS AVAILABLE**

This list includes all non-academic jobs This list includes all non-academic jobs currently available on the MIT campus. Duplicate lists are posted on the women's kiosk in Building 7, outside the offices of Special Assistants for Women and Work (10-215), and Minority Affairs (10-211), and in the Personnel Office (E19-239). Personnel interviewers will refer any qualified applicants on all biweekly jobs Grades applicants on all biweekly jobs Grades II-IV as soon as possible after their receipt in Personnel. Persons who are not MIT employees should call the Personnel Office on extension 3-4251.

Employees at the Institute should continue to contact their Personnel Officers to apply for positions for which they feel they qualify.

Dick Higham	3-42/8
Pat Williams	3-1594
Carolyn Scheer	3-1595
(secretary - Dixie Chin)	

Virginia Bishop Mike Parr 3-4266 Ken Hewitt (secretary Joy Dukowitz)

3-4275 3-2928 Sally Hansen Lewis Redding Richard Cerrato 3-4269 (secretary - Susan Bracht)

Spons. Res. Staff, temporary, Imple-Spons, Res. Staff, temporary, Implementation Manager, in the Automatic Programming Group, Project MAC: supervise and participate in design implementation, testing, review and maintenance of program modules; improve existing software; detect and correct errors in the existing system; select subproblems for student members of group. Experience in design. bers of group. Experience in design. debugging of large computer systems; ability to read and write LISP programs, knowledge of PL1, Multics, IBM 0S370, ITS and the ARPA network required. Temp. to 8/31/76. D76-9 (1/28).

Asst. V to handle secretarial and administrative aspects of large Earth and Planetary Sciences research group: monitor research accounts; handle personnel matters, space, furniture, parking allocations; do occasional library research. Typing skill, facility with figures required. Ad ministrative supervisory abilities desirable. B76-18 (1/28).

Secretary V, News Office, to handle senior secretarial duties: maintain biweekly payroll, files, circulation lists for publications; type, process news releases; serve as personal secretary to director. Will also monitor accounts, process bills; handle purchasing, petty cash. Requires excellent typing, ability to work under pressure. MIT experience desirable. 37½ hr. work week. B76-42 (1/28).

Secretary IV to Co-Directors, Office of Personnel Development to handle general secretarial duties: type, prepare meeting summaries, maintain files, compile materials, schedule appointments. Will also participate in office projects and functions. Good interpersonal as well as secretarial skills, plus felxibility and initiative necessary. Knowledge of behavioral science desirable. B76-47 (2/4).

Secretary IV to 3 Political Science faculty members: type varied material including correspondence and manuscripts; file; arrange travel and appointments; may include light editing duties. ments; may include light editing duties. Excellent secretarial skills, secretarial experience and some college training required. Applicants must be able to set priorities and work independently. B76-33 (1/28).

Secretary IV to Electrical Engineering and Computer Science Undergraduate Offices: Schedule committee meetings; abstract meeting minutes; provide secretarial support to student-faculty committees; type course material including technical data; compose responses to routine correspondence; maintain student files. Technical typing skill, initiative and ability to work independently required. Shorthand, MIT experience desirable. B76-30 (1/28).

Secretary IV to faculty members in Environmental Design Group, Urban Studies and Planning: type course material, reports, correspondence; armaterial, reports, correspondence; arrange appointments; duplicate, collate materials; compile data; maintain records, files; answer inquiries; do occasional library research. May be asked to help with general typing. Requires excellent typing, organizational skille plus providers office. tional skills, plus previous office experience. Secretarial school training desirable. B76-36 (1/28).

Secretary III-IV to Assistant Director of Admissions, primarily responsible for minority recruiting; handle corre-spondence; transcribe machine dictation; arrange meetings, travel; maintain files. Will also share reception work in busy four-person office. Requires busy four-person office. excellent typing, grammatical and organizational skills. Experience working with minorities desirable. Non-smoking office. B76-44 (2/4).

Secretary III-IV, Dean's Office, School of Architecture and Planning will provide support for Asst. Dean for Academic Administration: arrange appointments; type from machine dictation; compile information; occasionally draft correspondence Will also sionally draft correspondence. Will also

serve as receptionist: answer phone; handle mail; order supplies; help set up meetings, luncheons, etc.; maintain office appearance. Requires ability to work under pressure, flexibility, good typing skills. 2-3 years experience plus machine dictation skills preferred. B76-37 (1/28).

Secretary III-IV to two faculty members, research staff in Chemical Engineering: type course material, proposals, reports; arrange meetings and travel maintain records; great standards travel; maintain records; greet students, advisees. Requires excellent typing, organizational skills; ability to transcribe machine dictation. B76-40

Secretary III-IV to assist with two research projects in the Linguistics Group of the Reseach Laboratory of Electronics: schedule a regular series of project-related meetings including travel and hotel arrangements; type reports and manuscripts; maintain reports and manuscripts; maintain project accounts; perform other stan-dard secretarial duties as required. Good typing and general secretarial skills plus one year's secretarial experience required. Non-smoking office, B75-590.

Secretary III, temporary, for underite course in Materials Science Engineering: provide liaison graduate course in Materials Science and Engineering: provide liaison between faculty and students; type, duplicate course material; maintain files. Requires good typing, flexibility, ability to work under pressure. Temporary position: 2/1/76 through 5/30/76. B76-46 (2/4).

III in Undergraduate-Secretary Office, Aeronautics and Astronautics to type correspondence, technical reports; answer phones; file. Excellent typing, organizational, gram-matical skills, plus previous office experience required. Non-smoking office. B76-49 (2/4).

Secretary III to faculty member and large research group: arrange complex travel schedules for group; type technical and general material; independently compose correspondence. Will work under supervision of Admin. Asst. Excellent technical typing skill, ability to organize and maintain filing system and to work effectively with students and effectively with a students and effectively. students and staff required. B76-27

Secretary III, part-time, to faculty member in Urban Studies and Plan-ning. Will handle general secretarial duties: type course material, correspondence, reports; answer phones; duplicate materials; file. May be asked to help with general typing. Requires excellent typing and communication skills. 20 hrs./wk. 9am-1pm or 1pm-5pm. B76-35 (1/28).

Secretary III, Programming Develop-Office to assist department ary: type correspondence, secretary: type correspondence, reports; file; update computer listings; use computer system to obtain infor-mation (will be trained). Will also arrange travel and appointments; answer phones; order supplies; distrib-ute mail, memos. Requires typing ability. Experience using computer systems helpful. B76-38 (1/28).

Sr. Clerk IV, Medical Department to coordinate data for Dept. information system: collect source material; distrib-ute reports; monitor and edit data. Will also answer phone and other inquiries. May be asked to do occasional light secretarial work. Requires data processing experience, accuracy with detail, typing ability. Some college training desirable. B76-48 (2/4).

Sr. Clerk III, part-time, Resource Planning to handle distribution of MIT Leadership Campaign publications: maintain publication schedules; assemble packets and coordinate assemble packets and coordinate distribution; maintain distribution records, files, Will also draft and type records, files. Will also draft and type correspondence, answer phone inquiries. Requires typing, organizational, administrative skills, plus ability to work independently. 20 hrs./wk. B76-34 (1/28).

Sr. Clerk III/Keypunch Operator in Comptroller's Accounting Office to keypunch data on an Inforex Key-to-Disk data entry system. Will also verify and balance all data. Requires two years experience. Ability to create magnetic tapes helpful. B76-43 (2/4).

Clerk III in Accounting Office, Travel Section: type expense reimbursement checks; insure batch edit and voucher accuracy; handle travel problem inquiries, travel accounts. Requires typing, communication skills, plus two years office experience. B76-45 (2/4).

Sr. Clerk III, part-time, temporary in Center for Cancer Research to provide accounting assistance: prepare invoices; post information from requisitions, purchase orders, invoices; check monthly account statements; file orders; analyze expenditures, commitments; prepare grant and fund reports. Requires typing ability, plus facility with figures and detailed work. 20 Temporary through 8/31/76. B76-22 (1/28).

Sr. Clk.-Typist III for Neurosciences Research Program: type Program Bulle-tin on IBM MTST/Selectric Composer System (will be trained). Will also provide audio/visual assistance: project and copy slides; tape-record meetings; set up conference rooms; maintain files, equipment, library and journal storage. Must have good typing skills. B76-39 (1/28).

Bookchecker II in Hayden Library: assure proper charging of books; answer questions for users; file; write overdue notices; perform other clerical duties as necessary. Accuracy with detailed work, ability to deal effectively with people required. 35 hr. wk.; Sun., 1pm-11pm; Mon., Tues. Sun., 1pm-3pm-11pm; We B76-28 (1/28). Wed., Thurs. 4pm-11pm.

The following positions were still available at Tech Talk deadline. The date following each position is the date of the most recent Tech Talk issue in which the position was described.

ADMINISTRATIVE STAFF A75-56, Sr. Consult./Trainer,

# Dying Stars a 'Laboratory' For Physicists Studying Matter

for physicists, enabling them to study the behavior of matter at incredibly high temperatures, densi-

Personnel Development (10/8) A75-60, Systems Analyst, Off of Admin. Inf. Syst. (10/8)
A75-65, Acquisitions Editor, MIT Press (12/3)

A75-67, A Press (12/10) Acquisitions Editor, MIT A75-68, Project Planner, Planning

Office (12/17)
A75-69, Admin. Asst. Information
Proc. Center (12/17)
A75-71, Documentation Mngr.,
Off. of Admin. Inf. Syst. (1/7)

A75-72, Project Planner, Planning Office (1/7)

A75-74, Assoc. Staff Writer, Resource Planning (1/14)
A76-1, Admin Staff, Treasurer's Office (1/21)

BIWEEKLY: B75-543, Sec. IV, Chem. Eng. (10/15)B75-632. Sr. Acctg. Clk. IV, Medical (11/26)

B75-671, Sec. III-IV, Off. of Pres. & Chan. (1/7) B75-685, Sec. IV, Medical Dept. B75-687, Sec. IV, Sloan School

(1/14)
B75-689, Clk. IV, Civil Eng. (1/14)
B75-691, Sec. III, Law Relatd.
Studies (1/14)

B76-4, Sec. IV, Center for Inter. Studies (1/21)
B76-14, Sec. IV, Medical Dept.

B76-17, Sec. III, Materials Sci. & Eng. (1/21) B76-18, Admin. Asst. V, Earth & Planetary Sci. (1/21)
B76-19, Sec. IV, Graphic Arts

B76-20, Sec. IV, Inf. Proc. Center B76-21, Clk. IV, Summer Session

Office (1/28) B76-24, Sec. IV-V, Mrs Wiesner B76-26, Sec. IV-V, Elec. Eng. & Computer Sci. (1/28)

ACADEMIC STAFF: C75-34, Admin. Officer, Materials Sci. & Eng. (1/14) C75-35, Tech. Asst., Biology (1/14)

D75-8, Biophysicist, Nat. Magnet Lab (6/25) SPONS, RES. STAFF. D75-48, Economist, Energy Lab

(6/25)
D75-107, postdoc res., Lab for
Nuc. Sci. (6/25)
D75-120, Systems Programmer,
Lab for Nuc. Sci. (11/26)

D75-125, energy modeling, Energy Lab (8/6)
D 75-161, Economist/Policy
Analyst, Energy Lab (9/10)
D 75-167, end-use technology,
Energy Lab (9/17)

D75-169, Plasma Physicist, Res. Lab of Elec. (9/17)
D75-210, machine vision research, Artificial Intell. Lab (10/29)
D75-219, continuing education,
Chemical Eng. (11/5)
D75-220, Executive Director,
continuing education, Cemical Eng.

(11/5)
D75-226, neurophysiological research, Cent. for Space Res. (11/19)
D75-229, Research Engineer, Energy Lab (11/19)
D75-232, Programmer, Center for Space Res. (11/26)
D75-234, computer specialist, Proj. Mac (11/26)

D75-243, postdoc, res., computer

science, Artificial Intell. Lab (1/7)
D75-244, postdoc. res., computer science, Artificial Intell. Lab (1/7)

D75-249, postdoc. res. physics, Lab Nuclear Sci. (1/14) D75-250, postdoc. res physics, Lab

D75-250, postade, res physics, Lab Nuclear Sci. (1/14) D75-253, Mathematical model development, Energy Lab (1/14) D76-4, Programmer, Project MAC

D76-7, Project Coordinator, Energy Lab. (1/28)

EXEMPT: E76-2, RN, MIT Infirmary (1/14)

HOURLY: H75-55, Tech. B, Lab for Nuclear H75-117, Tech. B, Radioactivity

Center (10/15)
H75-120, Campus Patrol Officer

(10/1) H75-143, 2nd. Cl. Eng. (10/15) H75-172, Tech. A, Environmental Medical Service (1/14)

The following positions are on HOLD pending final decision: B76-6 Sec. IV

Tech. Instruct. Acad. Staff Acad. Staff C75-32 C75-33 B75-665 Acad. Staff Sec. IV Clk, III B75-681 B76-32 Tech Asst. V
The following positions have been
FILLED since the last issue of Tech

H76-1

B76-20 A75-73 C76-2

D75-205

Admin. Asst V Tech. Asst. Acct. Asst. V Cashier III E75-48 B75-672 B76-23 D75-166 Operations Branch Manager B75-627 Sec. III System Anal. DSR Sec./Rec. III B76-3 B76-25 B76-31 Sec. IV pt. Sec. IV-V

Tech. Asst. Admin. Asst.

Photographer C Sec. IV Assoc. Dir. Alumni Res. Eng. (cancel)

ties and magnetic fields, a physicist from MIT told an audience of physics teachers in New York City Monday (February 2).

Speaking at the 1976 Annual Joint Meeting of the American Physical Society and the American Association of Physics Teachers, Dr. Walter H.G. Lewin, professor of physics at MIT, discussed different kinds of dying stars that produce x-rays.

The sun itself (which is not yet dying) produces a small percentage of its radiation as x-rays; until 14 years ago this was the only known source of x-rays in space.

The most interesting and prolific sources of x-rays are the dying, collapsed stars. And x-rays from these stars enable physicists to study the behavior of matter at far greater densities, temperatures, and magnetic fields than could be created on earth, Professor Lewin said.

The size of a star is the result of two opposing forces, Professor Lewin explained: "It's a trade-off between the pressure (due to heat) that wants to blow the star up, and gravity pulling it together."

But when an old star runs out of nuclear fuel, the heat source vanishes. "What is left is gravity," he said, "and the star collapses."

Astrophysicists believe, he said, that a collapsing star can become one of three things, depending on the initial characteristics of the star: a white dwarf about the size of the earth, a neutron star about 10 kilometers across, or possibly a black hole -an eternally collapsing star with a gravitational field so great that no radiation can escape it. (Matter falling into a black hole could emit a last gasp of x-rays before disappearing forever-so physicists hope to prove the existence of black holes by studying x-ray emissions.)

'Possibly almost all x-ray sources in our Milky Way are binary systems -a 'living' star still burning nuclear fuel, and a dying, collapsed star orbiting around each other," Professor Lewin said.

When the collapsed star is a neutron star, it could be less than one-millionth as big as its "living" companion-although perhaps comparable in mass. Why do these compact objects produce x-rays?

X-rays are produced, Professor Lewin said, "when matter falls from the big companion star to the little star." Because the little star is so small, the matter has a long way to fall, and because it is so massive, the gravitational attraction is great, so free-falling matter reaches tremendous speeds-up to one-half the speed of light, if the little star is a neutron star.

As a result, the matter could heat up to hundreds of millions of degrees or more-hot enough to produce x-rays.

"But why would the gas want to fall from the big companion onto the little fellow?" Professor Lewin

There are two answers, he said. One involves what is known as the "inner Lagrangian point." This point, named after the famous 18th century French mathematician, is the point at which a pebble released (for example) between the earth and the moon would not know in which direction to fall.

If the companion star is big enough so that some matter extends beyond this Lagrangian point between the two stars, then matter will fall onto the little star.

In the other mechanism, matter is carried to the little star by the stellar wind coming from the big star. Stars are continually spitting out gas in the form of a stellar "wind."

If a star is very luminous, the wind

is "strong" and enough of the gas will come near the small star to produce observable emissions of xrays as it is sucked in.

Because the earth's atmosphere blocks x-rays, studies of x-ray sources have required rockets, balloons or satellites to lift x-ray detectors beyond the atmosphere. The first x-ray astronomy satellite, Uhuru, was launched in late 1970.

Now several satellites, including SAS-3 (Small Astronomy Satellite 3, funded by NASA and directed by MIT physicsts in the MIT Department of Physics and the MIT Center for Space Research) are studying xray sources

One of the puzzles they hope to solve, Professor Lewin said, is whether pulsating x-ray sources "are born slow and turn fast, or vice versa.'

(Some slow pulsars vary periodically in a few minutes; others are as fast as a few seconds.)

Professor Saul A. Rappaport of MIT also spoke at the New York meeting, on "Slow X-ray Pulsars: Neutron Star Masses."

Professor Lewin said that he and his associates hope to answer that question for at least one source (GX 1+4) this week by using SAS-3 to measure its period again. This slowly rotating object was discovered by Lewin's group in 1970 from balloon observations in Australia; its period appears to be speeding up by about four seconds a year.

A greater puzzle, he said, was the discovery reported last week by Professor George W. Clark of MIT, and MIT graduate student Jesse G. Jernigan, Jr., that strong bursts of x-rays from somewhere in the constellation Sagittarius are repeating at unheard of long intervalsapproximately once every four and a half hours-coming sometimes a little early and sometimes a little late.

In fact, Professor Lewin said, xray astronomy is now such a rich field that experimental data are piling up much faster than they can be explained.

"We're in desperate need of theories to explain the inescapable evidence," he said.

# Fraud Warning

A new scheme to defraud businesses and universities has surfaced recently in the Boston area, according to Robert E. **Durland of the MIT Purchasing** 

It is fraudulent invoices.

The way the scheme works, Mr. Durland said, is that invoices are sent directly to organizational units, such as departments or administrative offices, rather than a central authority, such as the Purchasing Office. The invoices are usually for modest sums-most in the \$75-\$200 range-making them easily acceptable to offices which do a normal amount of business with outside ven-

The fraudulent invoices often are for "annual subscription" or "listing in annual directory," or "1/2-page ad," Mr. Durland said, but may also cover goods never ordered or received.

Fraudulent invoices first appeared on the West Coast about a year ago and have surfaced locally only within the past few weeks. None have been reported so far at MIT, but offices at both Tufts and Harvard have received them.

To avoid getting taken, Mr. Durland recommended that all bills be screened carefully. If fraud is suspected, please notify Mr. Durland in the Purchasing Office, x3-7245.

# English Classes

English conversation classes for wives of foreign students, visiting faculty and staff will be offered for 10 weeks beginning Tuesday (Feb. 10), sponsored by the MIT Women's League.

Registration for the classes will be held Thursday (Feb. 5) from 10am to noon in Rm. 10-340. There is a \$20 fee for the course, and baby-sitting is available for an additional \$5.

For further information, call Mrs. Pinson, x3-3656 or Mrs. Reintjes, 484-3595.

# IAP Project Taught Students How to Lobby Congress

Six MIT undergraduates have returned to their classes after the winter break with some unusual insights-gained at first hand-into what it means to be a Congressional

The students researched the subject by going to Washington with a professor to lobby for a specific cause—a change in the way the United States deals with the Spanish government for the use of military bases in that country.

The project was the idea of Dr. William B. Watson, associate professor of history in the Department of Humanities and an expert on US-Spanish relations.

Professor Watson has been urging for some time that the agreement with Spain for the use of military bases should be a treaty requiring a two-thirds vote of the Senate rather than an executive agreement. For the past 22 years, the agreement has been renewed every five years with no approval at all by Congress.

He had gone to Washington on several occasions in the past six months to talk to various members of Congress. "One day in November I realized it might be interesting to teach students how to lobby Congress on a foreign policy issue by having them go to Washington to do

Professor Watson and Dr. Jeffrey L. Pressman, associate professor of political science, scheduled the trip as an IAP project-and soon had recruited the six students.

The students and Professor Watson were in Washington for three days, Jan. 20-23, and started off each day with breakfast in the Supreme Court cafeteria, a "pleasant, quiet place to discuss strategy.'

The first day was marked by a series of special briefings arranged by Professor Watson-by the Senate Foreign Relations Committee (on the committee's function and the legislative process), the State Department (on its point of view of what the relationship between the United States and Spain should be), the New York Times (on how foreign policy news is made) and the Coalition on National Priorities and Military Policy (on how Congress is lobbied on public interest matters by public interest lobbying groups).

The MIT students had been given reading assignments and background information before going to Washington.

"At the state department briefing," Professor Watson said, "they assumed we knew little or nothing, but it became quickly apparent from comments by the students that they knew quite a bit and had done their homework quite carefully. The level of discussion had to be raised considerably higher than the briefers had anticipated.'

The students set out to do their lobbying the next day, having made some appointments beforehand by telephone and by visiting offices.

Specifically, they were lobbying in behalf of Senate Resolution 295, which had been introduced the previous month by two senators and which said any agreement involving military bases in Spain must be submitted to the Senate for its approval as a treaty.

"We tried to convince the Senators, Representatives and their legislative aides that this was an important issue, not just for our relations with Spain," Professor Watson said, "but also for the Constitutional processes by which foreign policy is conducted. It involved the question of whether the Senate was going to play a more active role in the conduct of foreign policy. We felt this was a good time to lobby on this issue because the Senate in the past few years has become much more actively engaged in this area.'

There was a surprise, and some excitement, waiting for Professor Watson and the students at the end of their second day in Washington.

The lead story in the Washington Star that night was headlined: "US, Spain Agree on Treaty for 4 Military

"What that meant," Professor Watson said, "was that the administration had agreed to do what the

Recently returned from Washington, D.C., where they participated in an IAP activity on Congressional lobbying are (left to right) Christopher Donnelly, Aristides Papadopoulos, Carl Baranowski, Steven Kaplan (below), Dr. William Watson and James Leo. Not present when the picture was taken was Richard Fleischer.

Senate resolution wanted it to do. We couldn't take credit for the move, of course, but we think that the pressure we and others exerted was a factor in leading the administration into submitting the agreement as a treaty for the first time.

The development created a "minor crisis" for the MIT contingent, because it had made Senate Resolution 295 moot.

"We had our usual breakfast in the

ditions in Spain," he continued, "we agreed the United States would be wise to act prudently and to wait a while before it makes a treaty with a

Supreme Court cafeteria," he said, 'and decided to lobby Senators our last day in Washington on how they should respond to the treaty agree-

"Given the uncertain political con-

themselves, but stayed in private homes with friends of Professor Wat-Professor Watson said he was certain the trip was a valuable experience for the students. He remembers overhearing one of the students com-

ment, "I don't think I've been bored

government that might not have

last day, asking out of curiosity

whether Senators would have sup-

ported Senate Resolution 295, but

primarily lobbying for a slowdown in

the approval process and for caution

Altogether in three days the stu-

dents lobbied 26 members of Con-

gress, including 22 Senators and four

Representatives. Usually they talk-

ed to legislative assistants for for-

eign affairs, but they saw two Sen-

ators and four Representatives per-

sonally. Professor Watson estimated

that they must have made more than

100 telephone calls, walked collec-

tively more than 100 miles of Con-

gressional Corridors and altogether

The students paid for the trip

spent more than \$500.

"So we went around on Friday, the

much hope of surviving.

in committing ourselves.'

for one minute during the entire

The participating students were: Carl Baranowski, a freshman from Rome, N.Y.; T. Christopher Donnelly, a junior in economics from Pittsburgh, Pa.; Richard C. Fleischer, a freshman from Canton, O.; Steven F. Kaplan, a sophomore in management from Jericho, N.Y.: James D. Leo, a sophomore in life sciences from Los Angeles, Calif., and Aristides J. Papadopoulos, a sophomore from Greece.

# Ingenuity Nets Millions in Electronic Games Market

least another 40 in the next few

Sub-assembly factory operations in Billerica, Mass. and Nashua, N.H., were forced to create about another 50 new jobs to keep up with TV Tennis orders. At Universal Instruments, Inc., in Binghamton, N.Y., another supplier of equipment to Executive Games, ten employees were added.

Recent articles in Electronic Engineering Times and other electronics design periodicals have brought more than 500 written inquiries to the MIT Innovation Center about further commercialization of the games project and the possibility of en-gaging other MIT students in new product development.

Dr. Li explains that students are guided through the development and commercialization of their inventions by the Innovation Center Co-op, a branch of the Center that is to the inventor what the teaching hospital is to the medical student. Projects are overseen by Co-op general manager Lamar Washington, Jr., a ninemember advisory board including presidents of several corporations,

Clarke to Speak (Continued from page 1)

the author of 45 books. His non-fiction works include Interplanetary Flight, The Exploration of Space, Going Into Space, Profiles of the Future and The Promise of Space.

At the MIT-AT&T symposium, he will be the speaker March 10 at a plenary session in Kresge Auditorium at which the results of workshop sessions on several topics will be summarized.

Scholars from a number of universities have been commissioned to prepare papers for the workshops, which will explore the social effects of the telephone during its first 100 years, the future impact of computers and information processing, and the interaction of language and understanding, the mainstays of human communications.

The two-day symposium will include several special events, among them an opening address by President Wiesner and a closing dinner at which AT&T Chairman John deButts will speak. William C. Mercer, president of New England Telephone, will preside at the dinner.

and MIT faculty advisors

Under licensing arrangements established with MIT's Office of Sponsored Programs (OSP), the Innovation Center and the inventors of TV Tennis will share between three and five percent of the revenue received by Executive Games.

In other Center projects that are funded by the original NSF grant, the US Government is given the right to a royalty free license on any patents that are generated.

While TV Tennis has been one of the Center's most successful experiments in entrepreneurship, almost 200 other inventions have been processed with much less yield. Negotiations for a broad-based collaborative product development program with Wing Archery, Inc., have begun as a result of the company's interest in a new high efficiency bow devised by an Innovation Center faculty member and his students. The company had originally sent the Center one of its bows to be used in an Invention class as an example of a profit-making innovation on a centuries-old device.

MIT ingenuity intervened and the class designed an improved bow that maximizes energy transmitted to the arrow by the archer. This project, like the games effort, Dr. Li says, emphasizes technological innovation as one of the basic human instincts.

"The new challenge to technology represented in projects like TV Tennis must be considered a healthy one," he said. "It signals a shift in goals from that of pure engineering excellence to that of social relevancy. As service and leisure timerelated occupations exceed those aimed at industrial production, engineering as a profession will be conar wider far more fluidity than it was in years

"The university provides the logical place for such technological expertise because there are students with inquisitive minds, boundless energy and few social obligations to deter them from exercising those minds to all kinds of activity from acquiring knowledge to marketing new products. If this student contribution is combined with the needed peripheral support from professionals, then there is a chance of a business success that could be invaluable to all parties involved."

# Alumni to Hear Susan Schur

Susan E. Schur, owner and president of an advertising agency specializing in technical and industrial accounts, will speak Thursday, Feb. 12, at a luncheon meeting of the MIT Club of Boston in the Aquarium Restaurant, 100 Atlantic Ave., Boston.

A 1960 graduate of MIT, Schur will iscuss "There's Nothing New Under the Sun (Or, What's Happening Now Happened Then)."

She is a past president of the MIT Club of Boston and has been vice president of the MIT Alumni Association and president of the Association of MIT Alumnae.

Reservations can be made through Leena Kiirats, x3-3878.

# Faverman Exhibit

An exhibit of works by Mark Faverman entitled "The Arch and Other Sun Dials" is on view in MIT's Center for Advanced Visual Studies through Feb. 20.

Faverman, an environmental artist, sculptor, and urban designer and a fellow at CAVS, will show both events and sculpture in the exhibit. He is former director of visual and environmental arts of the Mayor's Office of Cultural Affairs, Boston.

# **Obituaries**

# Judith E. Montfort

Judith E. Montfort, 21, a senior in physics from Fishkill, N.Y., whose term address was 8 Fainwood Circle, Cambridge, died at Massachusetts General Hospital Monday evening after she was found unconscious in a restroom off the Given Room, a faculty-student lounge on the fifth floor of Building 35.

Funeral services will be held Thursday at 10am at St. Eulalia Church, Ridge St., Winchester. Visiting hours will be Wednesday 7-9pm at Lane Funeral Home, 760 Main St., Winchester.

# Frederick J. Butcher

Frederick J. Butcher, 55, head custodian for NW12 and NW13 in Physical Plant, died Saturday, Jan. 31.

An employee of the Institute since 1959, Mr. Butcher is survived by his mother, Marion, and a sister, Frances. He lived at 1 Cleveland St., Cambridge.

A memorial service will be held Thursday, Feb. 5, at 9am in St. Paul's Church, Cambridge.

Study Finds Press Coverage Heaviest for Wallace, Reagan

(Continued from page 1) ceptions and ways of coverage.

-There is a strong tendency for the press to act like race track announcers, "calling" the field of candidates. Two candidates who have been most affected by this racehorse psychology are Reagan and Wallace. Last summer, for example, Reagan was introduced as a clever politician with the commendable but foolhardy idea of challenging an incumbent. But he emerged in January in some news outlets as a "sure" winner. Wallace, conversely, was presented in the early fall as a serious candidate, but by January was considered by some "callers" to be no longer "viable."

-The 1976 presidential campaign will be extensively covered, with one major news organization planning to spend 60 percent more in covering the primaries this year than in 1972. In part, the extensive coverage is due to the large number of candidates in the field (as well as the possibility of third or fourth party candidates later), but plans also have been influenced " by the press' generally unhappy experience in the 1972 race and the resolve to do a better job this time." The researchers said most of the journalists they interviewed believed the press was taken in by the Nixon "surrogate" campaign and will be more aggressive in 1976.

The report also said that television panel interview programs such as Face the Nation, Meet the Press and Issues and Answers may be underrated by critics as a way for candidates to gain direct access to the public.

"They have been criticized for being too short in length, too superficial to develop a line of thought and too soft to offer any challenging questions," the report said. "In our preliminary analysis, however, the panel programs have emerged as one of the few ways that the 1976 candidate can counter his media 'label' and perhaps break out of any pigeonhole into which he has been con-

'Until real blocks of time are found by the networks for serious, full-scale debates among candidates," the report said, "the panel shows remain the principal means to watch the candidates in live, direct, uncontrolled appearances.'

The News Study Group has been videotape-recording appearances by major declared and undeclared candidates on television. It also has been analyzing coverage of the candidates in selected national newspapers and weekly news magazines. In addition, more than 20 interviews have been conducted with candidates, campaign workers, press secretaries, editors, news executives, reporters, .columnists and political analysts.

The research team began its work in the MIT Department of Political Science last summer. The project, which is directed by Edwin Diamond, a lecturer in the department and a journalist, has 11 months to

The researchers stressed that the interim findings could change significantly as the campaign goes on.

The News Study Group research is supported by the MIT Political Science Department and outside foundation funds. In previous years, the News Study Group has analyzed press coverage of the 1972 presidential campaign, the televised Watergate hearings in 1973, the Impeachment hearings in 1974 and both print and broadcast coverage of school desegregation in Boston during 1974 and 1975. Some of this research has been published in Diamond's book, The Tin Kazoo: Television, Politics and the News (MIT Press, 1975). Portions of the analysis thus far of the 1976 presidential campaign will be published in the Columbia Journalism Review next

## Child Care Reminder

DOES YOUR YOUNG CHILD NEED LOVING CARE WHILE YOU WORK OR STUDY?

Family Day Care offers an opportunity for your infant, toddler or pre-schooler to share experiences with other children while under the care of a warm and loving adult in a home environment.

The Child Care Office provides screening, placement and counseling services, as well as some equipment and materials. For information, call x3-1592 or stop by the Child Care Office, Rm. 4-144.