

Hint of Future In 3 Crystals Aboard Skylab

By PETER SPACKMAN

If all goes well, on May 14 three crystals of indium antimonide grown in the laboratory of two materials scientists at MIT will be carried into orbit around the earth aboard Skylab, where they will be partly melted and re-grown under zero-gravity conditions.

They are the seeds from which may eventually come the realization of such seemingly far-fetched ideas as a space factory for making the

The Skylab missions—which begin next week with an unmanned launch on Monday (May 14) and a manned launch on Tuesday (May 15) from Cape Kennedy, Fla.—will have a “lark” in the on-board guidance computer.

The mission program in the guidance, navigation and control system designed and developed at MIT's Charles S. Draper Laboratory was named SKYLARK by the MIT programmers and engineers who developed and verified it. It is a follow-on program to (Continued on page 8)

semiconductors essential to the multi-billion dollar solid-state industry, or an orbital power plant drawing energy from acres of solar cells that could be transmitted by microwaves to earth pollution-free.

The scientists are Harry C. Gatos, MIT professor of metallurgy and materials science and electrical engineering, and August F. Witt, professor of metallurgy and materials science at MIT. Their involvement with the Skylab project, the nation's next manned mission into space, began when the National Aeronautics and Space Administration (NASA) asked them to design an experiment to assess the potential of low gravity environment for the processing of electronic materials such as semiconductors.

The materials experiment is one of two areas in the Skylab missions that involve MIT people. The Skylab spacecraft, originally designed to carry US astronauts to the moon and back, employ on-board guidance, navigation and control systems developed at MIT's Charles S. Draper Laboratory. Draper engineers also program the guidance system computers for each mission, including the Skylab missions.

The materials experiment is one of some 50 that Skylab astronauts Charles Conrad, Joseph Kerwin and Paul Weitz will perform in their month in space. That month (Continued on page 8)

8 Universities Survey Area Economic Impact

MIT has joined with seven other colleges and universities in the Greater Boston area to conduct a comprehensive study of the economic impact of the institutions on the area and in the Commonwealth.

This survey is believed to be the first to be undertaken by a group of universities in a single area, according to Walter L. Milne, special assistant to the president

for urban relations.

The universities sponsoring the study are Boston College, Boston University, Brandeis, Harvard, MIT, Northeastern, Tufts and the University of Massachusetts at Boston.

Altogether, they have a combined enrollment of nearly 90,000 full and part-time students, faculties of nearly 15,000 and academic staffs and employees numbering

more than 24,000.

Among areas being investigated are purchases of goods and services; spending and banking patterns of university employees, students and faculty; the management of university assets such as cash in banks, bonds and investment portfolios; real estate holdings; borrowing patterns; construction activities; and use of community services.

Data collection is being carried out by members of each of the participating institutions. The study is being directed by George Mowbray of the Systems Research Group, of Toronto, an organization with previous experience in such studies.

As part of the survey, half of all full-time MIT personnel recently received confidential question- (Continued on page 8)



Springtime has brought a burst of music and flowers to MIT. Here, a string quartet plays under a magnificent flowering crab apple tree on the Great Court.

—Photo by Margo Foote

MIT's Financial Management is Reorganized

President Jerome B. Wiesner this week announced major changes in the organization of the financial management of MIT.

The changes, which will become effective July 1, call for separation of responsibility for the stewardship of MIT's financial assets and the management of its investments from responsibility for financial operations and financial relations.

Mr. Joseph J. Snyder, who has served since 1951 as Vice President and Treasurer, will continue beyond normal retirement in a full-time capacity as Treasurer of the Corporation, reporting to the Chairman of the Corporation, the President and the Executive Committee of the Corporation.

Mr. Paul V. Cusick, who has served since 1970 as Vice President for Business and Fiscal Relations, will become Vice President for Fiscal Relations reporting to the Chancellor, Dr. Paul E. Gray.

Mr. Stuart H. Cowen, who has served since 1970 as Comptroller, will become Vice President for Fi-

ancial Operations, also reporting to the Chancellor.

“Mr. Snyder, Mr. Cusick and Mr. Cowen, who together have served MIT in various capacities for a combined total of more than 70 years, have been and will continue to be the mainstay of the Institute's financial manage-

ment,” President Wiesner said. “The changes provide the basis for clarification of relationships and responsibilities as they have developed in recent years and promise, for the Institute, greater strength and flexibility in dealing with the financial pressures that are certain to continue to impinge

on us in the future. The new organization also is intended to bring the financial management closer to the academic operations of the Institute.”

As Treasurer of the Corporation, Mr. Snyder will have responsibility for investment policy, for the (Continued on page 2)



Mr. Snyder



Mr. Cusick



Mr. Cowen

MIT's Financial Management Structure Reorganized

(Continued from page 1)

management of investments, including real estate, for recommendations to the President and the Chancellor and to the Corporation Executive Committee concerning the allocation and disposition of funds and the long-term financial stability of the Institute. The internal audit function will report to the Treasurer.

The Associate Treasurer, Mr. Frederic W. Watriss, will assist Mr. Snyder in all duties of the treasurer with special responsibilities for real estate investments, insurance programs, financial aspects of benefit plans, and relations with deposit banks and custodians of securities.

Mr. Snyder will continue as an Officer of the Corporation, MIT's governing body, and will serve as a member of the Executive, Investment and Development Committees of the Corporation.

As Vice President for Fiscal Relations, Mr. Cusick will be responsible for fiscal relations with the federal government, with research sponsors, and with other universities.

In this connection, Mr. Cusick will be responsible for fiscal liaison with the Charles S. Draper Laboratory, Inc. during the period immediately after divestment from the university. The Draper Laboratory is scheduled to move to a fully independent mode of operation effective July 1. Mr. Cusick, in coordination with other senior officers, also will have responsibilities for the business, financial and contractual relationships of Lincoln Laboratory with the federal government. Lincoln, located in Lexington, Mass., is operated by MIT under federal contract.

Additionally, Mr. Cusick will serve as the contracting officer for

all building contracts, and will be responsible for patent and copyright licensing and for the MIT Purchasing Office. Mr. Cusick will continue as a member of the Institute's Research Policy Board, the Personnel Policy Committee and the Academic and Faculty Councils.

Mr. Cowen, as Vice President for Financial Operations, will have responsibility for all aspects of internal financial management including budgets, the management of money and internal banking functions, accounting and payrolls, the negotiation of indirect cost reimbursement, investment and benefits accounting, and the preparation of financial programs. He will serve as the Institute's contracting officer for sponsored programs and will be responsible for policies and operations concerning procurement and subcontracting for sponsored re-

search. He will continue as a member of the Academic and Faculty Councils.

Additionally, Mr. Cowen will have responsibility for the funding, reporting, budgeting, and business administration of sponsored research programs. These activities, presently organized as the Division of Sponsored Research and reporting to the Comptroller, will be renamed as of July 1 the Office of Sponsored Programs. The new office, under the continued direction of Mr. George Dummer, will report to Mr. Cowen in his capacity as Vice President for Financial Operations.

Mr. Snyder is widely known for his participation in the financial and business interests of the Institute as well as in investment management affairs in Boston.

Born in Findlay, O., in 1907, he was graduated from Carnegie Institute of Technology in 1931 and

from the Harvard University Graduate School of Business Administration in 1934. From 1943 to 1944, he was a special graduate student at MIT, and from 1944 to 1945 he was secretary of the budget and associate head of the Office of Business Administration at the MIT Radiation Laboratory. He was appointed Treasurer of the Institute in 1950 and Vice President in 1951.

Mr. Snyder is trustee and member of the board of investment of the Boston Five Cents Savings Bank, trustee of Cabot, Cabot & Forbes Land Trust, and director of The Colonial Fund, Inc., Arthur D. Little, Inc., Liberty Mutual Insurance Companies and Transcontinental Gas Pipe Line Corporation. He lives in Cambridge.

Mr. Cusick, born in Brookline, Mass., in 1917, was graduated from Bentley College of Accounting in 1939 and joined the MIT staff in 1944 as chief accountant for the Division of Industrial Cooperation, forerunner of the Division of Sponsored Research. Mr. Cusick served in various positions including that of associate director of the Division of Defense Laboratories from 1953 to 1954. He was appointed assistant treasurer in 1954, comptroller in 1957, and Vice President for Business and Fiscal Relations in 1970. Mr. Cusick is a member of the National Association of College and University Business Officers Committee on Governmental Relations. He makes his home in Wellesley, Mass.

Mr. Cowen, born in Coventry, R.I., in 1921, was graduated from Harvard College in 1942, received the degree of master of business administration from Harvard in 1948 and worked in industry before joining the MIT Division of Sponsored Research in 1960.

He was associate director of the Office of Research Contracts at Harvard from 1962 to 1964 when he returned to MIT as director of fiscal planning. He was appointed to the office of the administrative director of DSR in 1968 and was appointed Comptroller in 1970. He is a member of the executive committee of the National Council of University Research Administrations. He lives in Wellesley Hills.



KALEIDOSCOPE '73: A beruffled square dancer allemandes to the right of her partner....Winner of the pie-eating contest stands tri-



umphant with a blueberry and cherry pie smile....Unicycle turned bicycle? —Photos by Margo Foote



COMMENCEMENT WEEKEND

Special Convocation to Mark Women's Centennial

MIT will hold its 107th commencement exercises Friday morning, June 1, beginning at 10:30am in MIT's Rockwell Cage.

Some 1,300 seniors and graduate students are expected to receive degrees, including a record number of women students.

A feature of the traditional commencement and alumni weekend activities this year will be a Centennial Convocation celebrating the 100th anniversary of the graduation of the first woman from MIT, Ellen Swallow Richards.

Howard W. Johnson, chairman of the MIT Corporation will preside, as is customary, at commencement exercises. President Jerome B. Wiesner will present the commencement address and award the degrees individually to each of the graduates.

Other principals at the ceremony include Dr. James R. Killian, Jr., honorary chairman of the MIT Corporation, and Chancellor Paul E. Gray.

By custom, chief marshal will be the president of the MIT Alumni Association, Breene M. Kerr, '51, senior partner, Resource Analysis and Management Group, Inc., Oklahoma City.

Commencement week activities will begin Thursday, May 31, at 11am with the annual commis-

Awards Convocation

More than 30 members of the community will be honored for their contributions to Institute life at the annual Awards Convocation Thursday, May 10, at 11am in the Great Court, or in the Little Theatre in case of bad weather.

Included for the first time this year will be awards by the Graduate Student Council to faculty members for dedicated graduate teaching.

All members of the community are invited to attend.

sioning of officers from MIT's Army, Navy and Air Force ROTC units. Principal speaker will be Rear Adm. Richard E. Rumble, Commandant of the First Naval District. Sixteen students will be commissioned, two in the Army, ten in the Air Force and four in the Navy.

Annual alumni activities will begin Friday afternoon following commencement. Alumni classes spaced at five-year intervals will hold reunions on campus and at New England resorts, then join other alumni on campus Sunday

evening for the start of MIT's annual Alumni Days. The Alumni Days committee planning these events is headed by James O. McDonough, '43, of Concord and James H. Eacker, '55 of Sherborn.

The Centennial Convocation entitled "Focus on the Future: The Challenges and Opportunities" will take place June 2 and 3 on the MIT campus.

After welcoming remarks by Dr. Wiesner, the Convocation will open with an address, "Global Perspectives for the Coming Decade," by Adm. Elmo R. Zumwalt, Jr., Chief of Naval Operations, US Navy.

At a banquet that evening the speaker will be Mrs. Katharine Graham, president of the Washington Post Company.

On Sunday morning, a panel discussion on the history of women at MIT and the development of women's rights will be followed by the closing address, "The Status of Women Professionals: An International Overview," by Helvi Sipila, assistant secretary general for social and humanitarian matters at the United Nations.

There will be a special "Tech Night at the Pops" for alumni at Symphony Hall Sunday evening, June 3, with members of the Boston Pops Orchestra under the direction of Arthur Fiedler.

On Monday, June 4, alumni and guests will be on campus for a day-long program in Kresge Auditorium organized under the theme "Seeking a New Role for Technology."

Speakers on the Alumni Day Program include: Institute Professor Emeritus Harold E. Edgerton, a pioneer in stroboscopic photography; Dr. J. Herbert Hollomon, director of the MIT Center for Policy Alternatives; Dr. Margaret L. A. MacVicar, Class of 1922 assistant professor of physics and director of the Undergraduate Research Opportunities Program; and Institute professor and Sedgwick Professor of Biology Salvador E. Luria, 1969 Nobel laureate in medicine or physiology.

New Insurance Policies Issued

New John Hancock life insurance policies, reflecting revisions effective January, 1972, are being distributed by the Benefits Office to all campus and Lincoln Laboratory staff members covered by the contributory plan.

Distribution of the new policies will be completed within the next few months. Old policies should be destroyed when the new one arrives.

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Residence to Be Named for Asian Alumnus

MIT has announced plans to name a newly completed 24-story graduate student residence for Ping Yuan Tang, a 1923 alumnus and benefactor who at the time of his death in June, 1971, was head of a major Asian industrial complex based in Hong Kong.

Howard W. Johnson, Chairman of the MIT Corporation, said the new Tang Residence Hall on West Campus will be dedicated in memory of Mr. Tang at ceremonies Friday afternoon, June 1, following MIT's 1973 Commencement and Commencement Luncheon and coincident with the 50th reunion of Mr. Tang's Class of 1923.

Joining in the announcement, made Tuesday (May 8), President Jerome B. Wiesner said, "We are delighted to have this opportunity to honor a distinguished alumnus whose leadership in industry and in high public service abroad will serve as an enduring example for thousands of our foreign alumni everywhere and for generations of

MIT students. The Tang Residence Hall symbolizes the very great part which our foreign students play in the educational program at MIT."

Guests of honor at the June, 1973, dedication, besides Mr. Tang's classmates, will be several members of the Tang family from Hong Kong and New York City. Mr. Tang was the first of three generations of his family to attend the Institute. His son, Jack C. Tang, now a principal officer in the family firm, South Sea Textile Manufacturing Co., Ltd., received the S.B. degree in chemical engineering from MIT in 1949. A grandson, Martin Y. Tang, received the S.M. degree in industrial management from the Institute last June.

Prior to his death in 1971, Mr. Tang had taken a strong interest in the planning for the new graduate student residence at MIT. He had indicated a desire to participate financially in its support, and had been actively making plans to re-

turn to the Institute for the 50th reunion of his class.

Mr. Tang received his early education in his native Peking, China, and came to the US in 1919 to study industrial management at MIT, graduating in 1923. Following his graduation, he returned to China where he built an important industrial complex based in Shanghai and organized around the manufacture of such commodities as textile, flour and cement.

After the Communist regime took power in mainland China, Mr. Tang went to Hong Kong where he rebuilt his enterprises through his South Sea Textile Manufacturing Co., Ltd., which has operations throughout southeast Asia, including manufacturing facilities in Hong Kong. At the time of his death he was a member of both the Executive and Legislative Councils of the Government of Hong Kong.

Throughout his life, Mr. Tang placed great importance on edu-

cation. His company, for example, provides free schooling and vocational training for its 2,500 employees. At the time of his death, he was Chairman of the Board of Governors of New Asia College, a member of the Board of the Chinese University of Hong Kong, as well as chairman of a committee of Hong Kong leaders planning the establishment of a polytechnic institute in that city. He donated the funds for the building of the University Library at the Chinese University of Hong Kong and a memorial hall for National Tsing-hua University in Taiwan.

The new Tang Residence Hall on Memorial Drive at the westerly end of the campus provides apartment facilities for 400 single graduate students. The total \$6.7 million construction cost was financed, in part, through bonds issued by the Massachusetts Health and Education Facilities Authority and partly by a grant from the College Housing Loan Program of the US Department of Housing and Urban Development. More than \$1.5 million of the cost, however, came from private sources; the gifts of the members of the Tang family represent the largest contributions received by MIT from sources outside the United States since the founding of the Institute. The other major private donor was the Kresge Foundation.

The building is arranged in apartments for groups of two, three and four students. Each apartment includes a living room, dining area, kitchen and bath facilities and private bedrooms. Should future need require, the apartments are so arranged that they can be adapted for use by married students or young faculty.

The Tang Residence Hall is part of a continuing and long-range MIT effort to increase the amount of on-campus housing available for undergraduate and graduate students and to upgrade and improve existing facilities.

Open Meetings Being Held On Health Plan

Open meetings on the new MIT Health Plan, which is now enrolling members, are being held at noon today and tomorrow (Wednesday and Thursday) in Room 26-100.

Other noon meetings have been scheduled Wednesday, May 16, at noon in the Schell Room at Sloan Building (E52-461), and Thursday, May 17, in Room A-166 at the Lincoln Laboratory.

Medical Department representatives will answer questions of faculty, staff and employees about the plan, which is due to go into effect July 1 as an alternative to the present Blue Cross-Blue Shield coverage.

Picnic Planned As Wick Tribute

A picnic celebrating Emily Wick's appointment as dean of the faculty at Mount Holyoke College is scheduled for the McCormick Hall courtyard Friday, May 11, at 5pm.

All friends of Professor Wick are invited to bring a sandwich and come. Dessert and coffee will be provided by the Association of Women Students.

ADDITIONAL POST

Ira Dyer to Direct Sea Grant Program

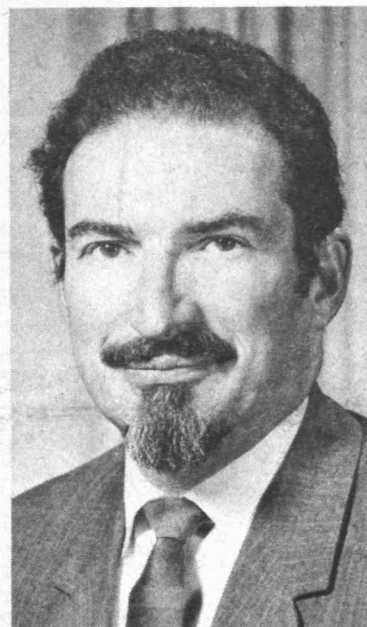
Dr. Ira Dyer, professor and head of the MIT Department of Ocean Engineering and a widely known authority on acoustics and related underwater phenomena, has been named to the additional post of director of the MIT Sea Grant Program, effective July 1.

Announcement of the appointment was made by Provost Walter A. Rosenblith. Dr. Dyer has been associate director of the Sea Grant Program for the past year. As director he will succeed Dr. Alfred A. H. Keil, Dean of the School of Engineering, who has headed the Sea Grant Program since its inception in 1968.

Dr. Dyer will continue as professor and head of the Department of Ocean Engineering. Dr. Keil will continue in an advisory capacity as chairman of both the MIT Sea Grant Council and the Provost's Sea Grant Policy Committee.

As Sea Grant Program director, Dr. Dyer will manage Sea Grant's wide spectrum of educational and research projects within the Institute, as well as the Program's advisory services concerned with marine problems of the New England region at large. The Sea Grant Program, sponsored by the National Office of Sea Grant, a division of the National Oceanic and Atmospheric Administration, is dedicated to the proper development of marine resources with emphasis on ocean utilization and coastal zone development.

A physicist and educator as well as research and development manager, Dr. Dyer was a vice president and a senior officer of



Dr. Dyer

Bolt Beranek & Newman, Inc. (BBN), a Cambridge-based research and consulting firm, from 1951 to 1970 when he joined the MIT staff.

As founder and director of the Physical Science Division, BBN's largest department, Dr. Dyer was involved in research concerning motion of the sea-air interface and resulting airblasts caused by underwater explosions, the instability of burning gases, and the experimental design and analysis of acoustic bottom-loss measurements.

Professor Dyer also founded and headed BBN's Program for Advanced Study, focusing on the continuing education of engineers. He established a curriculum which included studies in optics, random processes, oceanography, under-

water acoustics, data transmission systems and control theory.

Later, as founder and president of General Oceanology, a subsidiary of BBN, he directed engineering design and development of special-purpose ocean equipment. It was at this time that Professor Dyer served as advisor to projects sponsored by the US State Department on utilization of ocean resources of particular relevance to developing nations.

Dr. Dyer received his SB degree in 1949, SM degree in 1951 and PhD degree in 1954, all from MIT. He became a senior lecturer at MIT in 1970. He was appointed professor of ocean engineering in June, 1971, and head of the department in October of that year.

Among his numerous memberships, Professor Dyer is a fellow and the vice president of the Acoustical Society of America for 1974. He is recipient of the Biennial Award of the Society. He serves on the Science Advisory Committee of the US Coast Guard and on the board of visitors of the Maine Maritime Academy.

He is a member of the Institute of Noise Control Engineering and is on the board of editors of the Journal of Sound and Vibration, the major publication of the British Acoustical Society. He is a member of Sigma Xi, the Marine Technology Society, the Society of Naval Architects and Marine Engineers and the American Geophysical Union.

Professor Dyer is the author of many widely published works in engineering and science. He makes his home in Newton, Mass.

Grass Playgrounds in the Form of Volcano Craters

Models of six grass playgrounds designed by Stanley Resnicoff, a fellow at the Center for Advanced Visual Studies, will be on display at MIT's Hayden Courtyard May 11 through June 14 under the sponsorship of the Committee on the Visual Arts.

Resnicoff planted and landscaped each model playground in the form of a crater surrounded by sand moats.

"I have taken from the earth one of its basic forms, that of the volcano crater, and have reinterpreted its scale for people by using existing ecological systems," he said.

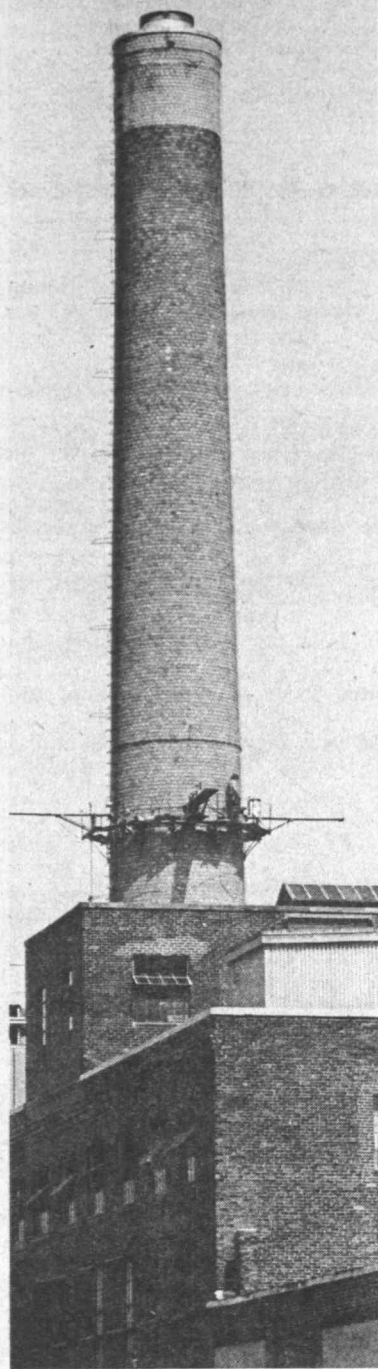
The playgrounds on display are working models planted in concrete pots five feet in diameter.

Resnicoff has used them as testgrounds for soil and grass experimentation.

Personnel at the Arnold Arboretum, where the models were planted, helped in soil preparation for the models, and members of the MIT physical plant have assisted Resnicoff in setting up the exhibit.

Resnicoff received his Bachelor of Industrial Design from Pratt Institute in 1968. In 1969 he worked in an Eskimo Village with VISTA and from 1970 to 1972 was head designer for the Hawaii Curriculum Center in Honolulu. He has been at MIT since 1972.

There will be a public opening of the exhibit on Friday, May 11 from 8 to 10pm.



Perched on a wooden catwalk, a workman takes a sample of the smoke flow from the smokestack atop MIT's main power plant on Vassar Street. Similar tests are being made on MIT's nine major smokestacks to determine if emissions conform to national and state air pollution standards.

Gray Plans Open Meeting On Tuition

Chancellor Paul E. Gray has scheduled an open meeting on MIT tuition charges at 4pm Monday, May 14, in Room 10-250.

"This open meeting is intended to provide an opportunity for a discussion of the factors that influence tuition, and to give those who would like to raise questions or express viewpoints concerning the Institute tuition policy a chance to do so," Dr. Gray said.

The Chancellor said he would open the meeting with a brief presentation concerning recent tuition history, comparisons with the cost of education at MIT, with academic program costs, with tuition at other private institutions and with changes in the cost of living and median family income.

MIT tuition for the 1973-74 year was announced nine months ago at \$3,100, a \$200 raise over the 1972-73 year. Tuition for the 1974-75 year will be determined during the next two months.

Coast To Be Topic

A state-industry workshop on the Coastal Zone Management Act of 1972 will be held Thursday, May 17, at the MIT Faculty Club. The workshop is sponsored by the MIT Sea Grant Program and the State-Industry Council.

THE INSTITUTE CALENDAR

May 9
through
May 18

Events of Special Interest

Creative Photography 4.051 Lottery

Students interested in placement in this over subscribed course. Sign up for lottery, May 9, Rm W31-310. Drawing on May 10.

Contrapunctus

MIT and Wellesley Counterpoint Classes present music for voices, instruments and electronic tape, directed by Lyle Davidson and David Paterson. Wed, May 9, 12n & 1pm, Lobby bldg 7.

Open Poetry Reading

Wed, May 9, 4pm-7pm, Hayden Court Yard. Refreshments.

Awards Convocation

Thurs May 10, 11am, Great Court (in case of rain Kresge Little Theatre). Brass Choir will present music.

Balloon Carpet

Otto Piene presents a pneumatic spectacular "More Sky, More Light, More Air." Thurs & Fri, May 10 & 11, 9am-5pm, Kresge Plaza.

Association of Women Students and the Cheney Room—Open House

Thurs, May 10, 4pm-6pm, Rm 3-310. Come and bring a friend.

Advisory Committee on Shareholder Responsibility

Thurs, May 10, 5:15pm, Rm 10-300.

Played Form

Department of Architecture Chamber Group will perform works by Beethoven, Dohnanyi and Mozart. Fri, May 11, 12n, Lobby Bldg 7.

MIT Moot Court of Appeals, IV

Stanley v. Illinois: The right of an unwed father to participate in a hearing concerning the disposition of his illegitimate children. Judges: David Nelson, Roxbury Municipal Court judge; J. Daniel Nyhart, special assistant to the MIT Chancellor for preprofessional programs and coordinator of law-related studies. Petitioners: David Bok, urban studies, '74; Gloria Ridley, urban studies, '74. Respondents: Richard Strempek, civil engineering, '74; Charles Taylor, urban studies, '74. Mon, May 14, 3pm, Stu Ctr Rm 400.

Open Meeting Concerning Tuition

Chancellor Paul E. Gray and others, will discuss recent considerations affecting tuition charges. Open to all members of the MIT community. Mon, May 14, 4pm, Rm 10-250.

MIT Moot Court of Appeals, V

Roe v. Wade: The right of a woman to have an abortion. Judges: Antonia Chayes, clerk to federal judge Charles E. Wyzanski; Nancy Gertner, associate member of the firm Zalkind and Silvergate. Petitioners: Judith Singer, political science, '74; Beth Karpf, urban studies, '75; Van Dunn, biology, '74. Respondents: Susan Bartlett, economics, Wellesley, '74; Joel Bergman, Sloan School, '73. Wed, May 16, 3pm, Stu Ctr Rm 400.

Open Meeting on Financial Aid Applications, 1973-74

Discussion of changes in reapplication procedures for financial aid for 1973-74. Thurs, May 17, 3pm; Fri, May 18, 10am, both in Rm 10-250.

Seminars and Lectures

Wednesday, May 9

GK 101, Its Mechanism of Action and Dental Application

Prof. Joseph H. Kronman, orthodontics, Tufts Dental School. Oral Science. 3pm, Rm E18-301.

DDT: Fact and Fiction

Dr. John W. Kanwisher, WHOI. Earth and Planetary Sciences Seminar. 4pm, Rm 54-100.

Gauge Theories with Superweak CP-Violation

Prof. A. Pais Rockefeller University. Join Theoretical Physics Seminar. 4pm, Rm 6-120. Coffee, 3:30pm, CTP Seminar Room.

Synthetic Organic Chemistry, IV

Teruaki Mukaiyama, Karl Pfister visiting professor, Tokyo Institute of Technology. Chemistry Seminar Series. 4pm, Rm 4-270.

Life as a Hassid in a Scientific Society

Prof. A. M. Hasofer, visiting professor civil engineering and Atara Hasofer, clinical psychologist. Hillel Seminar. 8:30pm, West Lge, Stu Ctr.

Thursday, May 10

Achieving Noise Control Objectives for Rail Transit at Minimum Cost

Dr. Robert Lotz, Transportation Systems Center, US Department of Transportation, Cambridge, Mass. 4pm, Rm 3-370. Coffee, 3:30pm, Rm 1-114.

Application of Gas Chromatograph—Mass Spectrometer—Computer Methods to Analysis of Body Fluids

Tyrone Smith, MIT. Analytical Chemistry Seminar. 4pm, Rm 8-105.

Interdependence of Sintering Mechanisms

Prof. M. F. Ashby, Harvard. Ceramic Seminar Series. 4pm, Rm 31-161. Coffee, 3:40pm.

Public Transportation in New Jersey—How Can We Improve It?

Nelson Slater, Jr, director's office, New Jersey Department of Transportation. 4pm, Rm 33-419. Coffee, 3:30pm, Rm 33-411.

The Stereochemistry of the Degenerate Thermal Rearrangement of a Methylene-cyclobutane

Prof. John E. Baldwin, University of Oregon. Organic Chemistry Seminar. 4pm, Rm 4-270.

Technology Studies Workshop

"Primitive or Regressed?": The Abandonment of Technology by Certain Cultures." Dr. Carleton Gajdusek, speaker. Commentators: Prof. Elting Morison, 1926 Killian Professor and Prof. Jerome Lettvin, biology and electrical engineering. 4pm, Rm 14E-304. Coffee, 3:45pm.

What's Wrong with the Boltzmann H Theorem: Part II

Prof. Joseph H. Keenan, mechanical engineering, MIT. Thermodynamics Seminar. 4pm, Rm 3-343. Coffee.

Food Additives, Nutrition and Public Interest Science

Dr. Michael Jacobson, director, Center for Science in the Public Interest. Washington, DC. Nutrition and Food Science Seminar. 4:15pm, Rm 54-100. Coffee, 4pm.

The Retinex Theory of Color Vision

Prof. Edwin H. Land, visiting Institute professor. Physics Colloquium. 4:30pm, Rm 26-100. Coffee, 4pm, Rm 26-110.

Dependency and Development***

Prof. Andreas Papandreou, economics, York University, Toronto, former Greek cabinet minister. Graduate Economics Association and Center for International Studies Seminar. 4:30pm, Sloan Penthouse.

The Green Revolution and Rural Income Distribution in Pakistan

Dr. Carl Gotsch, economist, Harvard Development Advisory Service. Seminar on Technical Transfers and Social Change in the Third World. 7pm, Rm 10-280—Jackson Room. Foreign students particularly welcome.

Filling Some Holes on the Energy Front

Mike McCormack, US Congressman. Electrical Engineering Colloquium. 8pm, Rm 9-150.

Greece: A Case Study in American Imperialism*

Prof. Andreas Papandreou, economics, York University, Toronto, former Greek cabinet minister. Graduate Economics Association and Center for International Studies Seminar. 8:30pm, Sala de Puerto Rico.

Friday, May 11

Tunneling and Transportation

Eugene L. Foster, chief, Tunneling Projects Office, Department of Transportation, Washington DC. Mechanical Engineering Seminar. 3pm, Rm 3-270. Coffee, 4pm, Rm 1-114.

Laser-Fusion and Physics

Prof. Moshe Lubin, Institute of Optics and Department of Aerospace Sciences, Rochester University. Plasma Dynamics Seminar. 4pm, Rm 26-214.

Tunable Laser Infrared Spectroscopy Using Semiconductor Diode Laser

Dr. Kenneth W. Nill, Lincoln Lab. Materials Science Colloquium. 4pm, Rm 9-150. Coffee, 3:30pm.

Aircraft Structures and the Men Who Developed Them

Nicholas J. Hoff, professor emeritus, Stanford University. Aeronautics and Astronautics' Lester D. Gardner Lecturer. 5pm, Rm 9-150.

Monday, May 14

Nuclear Engineering 22.911/22.912 Doctoral Seminars

G. Ducat, "More on the Parfait Blanket Concept;" D. Komm, "Synchrotron Radiation." 3pm, Rm NW12-222.

Multiple Transitions in Semi-Crystalline Polymers, The Low Temperature Toughness of Polyethylene

Dr. Raymond Boyer, Dow Chemical Company. Polymer Mechanical Behavior Seminar. 4pm, Rm 3-133.

Electrohydrodynamics of Liquids and Fluidized Beds

Prof. James R. Melcher, electrical engineering, MIT. Applied Mathematics Colloquium. 4pm, Rm 2-338.

Names, Essences, and the Ambiguity of "Got"

Prof. Paul Benacerraf, philosophy, Princeton. Philosophy Seminar. 4pm, Rm 14E-304.

Structure of Amorphous Materials

Dr. Praveen Chaudhari, IBM Research Lab, Yorktown Heights, NY. Physical Metallurgy Seminar. 4pm, Rm 13-2101.

Water Distribution Systems Analysis

Dr. Uri Shamir, research, IBM. Water Resources and Hydrodynamics Seminar. 4pm, Rm 48-316. Coffee, 3:30pm, Rm 48-424.

Monotone Solutions of Extremal Problems on Lattices

Prof. Arthur F. Veinott, Jr., Stanford and Yale. Operations Research Center Seminar. 4pm, Rm 24-307. Coffee.

Tuesday, May 15

Power Dissipation and Physical Limits in Computer Electronics

Dr. Robert W. Keyes, IBM. Special Electrical Engineering Seminar. 12n, Rm 9-150.

Satellite Solar Power Station

Prof. John F. McCarthy, aero/astro and students. Aero/Astro General Seminar. 1pm, Rm 33-206.

Teaching and Learning in Higher Education: Implications of Developmental Theory

Prof. Bernard Kaplan, Clark University. Student Committee on Educational Policy and the Education Division Steering Committee Seminar. 2pm, Rm 9-150.

Promoting Innovation in US Police Departments

Joseph Lewis, director of evaluation, Police Foundation, Washington, DC. Operations Research Center, Innovative Resource Planning Project Seminar. 3pm, Rm 3-133.

Shape Descriptors for Biological Images

Jack Bowie, electrical engineering, graduate student. CIPG Seminar. 4pm, Rm 20B-222. Coffee, 3:30pm.

Aerodynamic Impact Sounds

Dr. D. Graham Holmes, research associate, mechanical engineering, MIT. Interdepartmental Acoustics Seminar. 4pm, Rm 3-370. Coffee, 3:30pm, Rm 1-134

Numerically Controlled Machining of Propeller Blades

J. Lester Klein, director of research, Bird-Johnson Company, Walpole. Ocean-Engineering Seminar. 4pm, Rm 3-446. Coffee, 3:30pm.

Galaxie Formation

Dr. R. F. Stein, physics, Brandeis University. Astrophysics Colloquium. 4:15pm, Rm 37-252. Coffee, 4pm.

Chromatin Structure and Function

Dr. Gary Felsenfeld, molecular biology, National Institute of Arthritis and Metabolic Diseases. Biology Colloquium. 4:30pm, Rm 6-120. Coffee, 4pm, Rm 56-520.

Wednesday, May 16

Behavior Modification in a First Grade Classroom

Prof. Roy Feldman, political science, MIT. Education Division Colloquium. 12n, Rm 9-150.

Mutant Studies on the Regulation of Microbial Aromatic Degradation

Dr. R. C. Bayly, Monash University, Melbourne. Microbiology and Biochemical Engineering Seminar. 3:30pm, Rm 16-134.

Thursday, May 17

The Formation of Nitric Oxide by Combustion of Nitrogen Containing Fuels

Richard C. Flagan, graduate student, mechanical engineering. Mechanical Engineering Doctoral Thesis Seminar. 2:15pm, Rm 3-446.

Friday, May 18

Creep in Composite and Oriented Thermoplastics

Prof. D. W. Saunders and Dr. M. W. Darlington, Cranfield Institute of Technology, U. K. Polymer Mechanical Behavior Seminar. 3pm, Rm 3-133.

Surface Polaritons—EM Modes at Interfaces

Prof. Elias Burstein, physics, University of Pennsylvania. Material Science Colloquium. 4pm, Rm 9-150. Coffee, 3:30pm.

Community Meetings

Association of MIT Alumnae

Prof. Heather Lechtman, departments of humanities, metallurgy and materials science, MIT, will discuss "Styles in Pre-Columbian Metallurgy." Wed, May 9, 7:30pm, MIT Faculty Club. Dinner 6:30pm, reservations, Margaret Coleman, 926-1350.

MIT Club of Boston

Cmdr. George K. Gowans, deputy director, Management Information Center, Office Oceanographer, US Navy, will discuss "New Directions in Oceanographic Research and Development." Thurs, May 10, 12:15pm, Aquarium Restaurant, 100 Atlantic Ave, Boston. Lunch \$3.60 at door. Reservations: Miss Kiirats, X3-3878.

MIT Silver Club***

Spring meeting of members and all women who have worked at MIT for 25 years. Fri, May 11, 5:30pm, MIT Faculty Club.

Women's Forum

Open meeting and planning session for fall programs to be organized this summer. Your participation is encouraged at this time if you wish to see Women's Forum continue. Mon, May 14, 12n, Rm 10-105.

Stanford Club of Boston

Prof. Don Kennedy, chairman, Department of Biology, Stanford, will speak informally to those interested in Stanford or biology. Tues, May 15, 6pm, Harvard Faculty Club. Admission: \$3 per person; \$2 per student, open bar.

Faculty Meeting

The faculty will hold a regular meeting on Wed, May 16 at 3:15pm, Rm 10-250.

Women's Forum

Informal discussion with bi-weekly employees. Every Tues, 12n, Rm 3-463.

MIT Club Notes and Meetings

Bridge Club

ACBL Duplicate Bridge. Thurs, 7pm, Stu Ctr Rm 491. No card fees if under 5 tables. Call X0453 Dorm.

Chess Club

Sat and Sun, 1:30-5:30pm, Student Center Rm 473.

Classical Guitar Society

Classes, group or private. Mon & Thurs, 5-8pm, Rm 1-132, 134, 136; Sat, 8am-12n, Rm 5-231, 232. Vo Ta Han, 494-8353.

Ergo

Staff meeting. Sun, 7pm, Student Center Rm 443.

Goju Karate Club*

Open to the Cambridge Community. Mon, Wed, Fri, 7:30pm, Stu Ctr Rm 407. Call 253-2018.

Hobby Shop**

Mon-Fri, 10am-6pm, Rm W31-031. Fees: \$6/term for students; \$10/term for community. Call X3-4343.

Judo Club**

H. Yanagi, 5th degree black belt, chief instructor. Mon, Wed, Fri, 5-6:30pm; Sat, 1-3pm; duPont Exercise Rm. M. Portnoff, X3-5954.

Kung Fu Club**

Northern Praying Mantis. Tues, Thurs, 7-9pm, T-Club Lge. H.C. Wong, 876-5701.

MIT Wheelmen**

All aspects of bicycles and bicycling discussed, events planned, advice and help given. Thurs, 7:30pm, Rm 1-246. Call Harry, X3-2384.

MIT/DL Duplicate Bridge Club**
Tues, 6pm, Student Center Rm 473. Call X0453 Dorm.

Rugby Club**
Practice sessions; Tues, Thurs, 5pm, Briggs Field; Sat, 1pm, meet in DuPont Gym.

Student Homophile League*
Meeting and coffee hour. Sun, 4-6pm, Rm 14E-307. All men and women welcome. For gay help (anonymous) at MIT, call student gay tutor, 492-7871, anytime.

Science Fiction Society*
Fri, 5pm, Rm 1-236.

Scuba Club
Compressor hours, Mon & Fri, 4-6pm, Alumni Pool.

Strategic Games Society
Sat, 1pm, Walker Rm 318. Club offers opponents and discounts on merchandise to members plus gaming periodicals library. Kevin Slimak, X0389 Dorm.

Student Information Processing Board Meeting*
Mon, 7:30pm, Rm 39-200.

Yae Kwon Do Club
Tues, Thurs, 5-7pm; Sat, 11am-1pm. duPont T-Club Lounge. Call Jae Kim, X9212 Dorm.

Tech Engineering News**
General staff meeting, Sun, 5pm, Rm W20-453.

Technique
Staff meetings. Sat, 11am, Student Center Rm 451.

Tech Squares***
Western style square dancing. Tues, 8-11pm, Sala de Puerto Rico. Admission: \$1. First time free.

Tiddlywinks Association*
Wed, 8pm, Student Center Rm 491.

Unicycle Club*
Activities and beginners' session, Sun, 1pm, in front of Student Center.

Social Events

Friday Afternoon Club**
Music, conversation and all the cold draft you can drink. Fri, 6pm, the Thirsty Ear, Ashdown basement. Admission: \$1 men, 50 cents women. Must be over 18.

Muddy Charles Pub**
Join your friends for music, beer, wine, snacks, conversation at the Muddy Charles Pub, 110 Walker. Hours: Mon-Fri, 11:30am-2pm and 4-7:30pm; Sat, 7-12pm. Nightly specials will include: Mon, all wines 25 cents; Tues-Thurs, free pretzels and chips. Call GSC, X3-2195.

SCC Pot Luck Coffeehouse*
Live entertainment Fri-Sat, 8:30pm-12m. Student Center Mezzanine Lounge. Free coffee, cider, doughnuts. Sponsored by Student Center Committee. Volunteers to perform or otherwise help out, call Paul Mailman, X9626 Dorm, or Doug Fried, X8767 Dorm.

Movies

Film and Lecture Series
Architecture 4.097. Stan Brakhage, experimental filmmaker, will lecture and show his films. Wed, May 9, 2pm and again at 7pm, Rm E21-010.

Blood of the Condor (Yawar Mallku)
Humanities 21.492. Wed, May 9, 7pm, Rm 10-250.

The Prime of Miss Jean Brodie
Humanities 21.03. Thurs, May 10, 9pm, Rm 10-250.

The Andromeda Strain
LSC. Fri, May 11, 7pm & 10pm, Rm 26-100. Tickets 50 cents, MIT/Wellesley ID.z

The Hunchback of Notre Dame (silent)
Student Center Committee Midnight Movie Series. Fri, May 11, 12m, Sala de Puerto Rico, Stu Ctr. MIT/Wellesley ID.

A Clockwork Orange
LSC. Sat, May 12, 4, 7 & 10pm, Rm 26-100 (come early). Tickets, 50 cents. MIT/Wellesley IDs.

Crazy House
LSC. Sun, May 13, 7pm, Rm 10-250. Tickets 50 cents, no IDs.

Persona (Bergman)
Humanities 21.299. Mon, May 14, 7pm, Rm 10-250.

Billy Budd
Humanities 21.03. Tues, May 15, 7pm, Rm 10-250.

Film and Lecture Series
Architecture 4.097. Stan Brakhage, experimental filmmaker, will lecture and show his films. Wed, May 16, 2pm, and again at 7pm, Rm E21-010.

Women in Love
Humanities 21.03. Wed, May 16, 9pm, Rm 10-250.

Music

Noonhour Concert
The Wellesley Madrigal Singers. Thurs, May 10, 12n, Chapel. Free.

MIT Symphony Orchestra
Orchestra conducted by David Epstein will perform Mahler's *Fifth Symphony* and Mozart's *Overture to the Marriage of Figaro*. Sat, May 12, 8:30pm, Kresge. Tickets: \$1 at the door.

Choral Society
Program will include works by Britten, Schubert, Poulenc and Stravinsky. Sun, May 13, 3pm, Kresge. Tickets, available at the door: \$3 for reserved seats, \$2 for unreserved seats, \$1 students with IDs. For reservations call x3-4720.

Chamber Music Concert
With piano, winds and soprano. Works by Poulenc, Hoffman and Debussy. Mon, May 14, 8pm, Music Library.

Magic Flute
Mozart's opera performed by the MIT Opera Workshop, directed by John Cook. Wed, May 16, 8pm, Kresge Auditorium. Tickets, \$.50 at the door and in the Lobby of Bldg 10.

Noonhour Concert
The Mordor String Quartet. Thurs, May 17, 12n, Chapel. Free.

Glee Club
Rehearsals. Works by Mozart and Schubert. Tues, Wed, Thurs, 5pm, Kresge.

Theater and Shows

The Good Woman of Setzuan
MIT Community Players. Thurs-Sat, May 10-12 & May 17-19, 8pm. Sun, May 20, 4pm, Kresge Little Theater. Tickets \$2.50. Discount to MIT students. Reservations, x3-4720.

Community Players
Monthly meeting with presentation of "On the Death of Kings" by Dean Whitlock, playwright. Mon, May 14, 7:30pm, Mezzanine Lge, Stu Ctr. Refreshments.

Dance

Piobolus Dance Theatre
Four-man acrobatic-dance company. Fri, Sun, May 11, May 13, 8:30pm, Kresge. Tickets: \$3-\$5 at the door; \$2-\$4 in advance. For reservations call, 734-9334, or TCA, x3-4885.

Dance Workshop
Courses in Modern, Afro-American and M/J/B dance. For information Chris Peterson, 492-6983.

Folk Dance Club*
International, Sun, 7:30-11pm, Sala. **Balkan**, Tues, 7:30-11pm, Student Center Rm 491. **Israeli**, Thurs, 7:15-10:15pm, duPont T-Club Lounge. **Afternoon dance break**, Fri, 12:30-1:30pm, Bldg 7 Lobby.

Yoga Class
Beginners class. Fri, 5:45pm, Bldg 10-340. For information call Ei Turchintz, 862-2613.

Kundalini Yoga
Classes: beg, Mon & Fri, 1pm, duPont Wrestling Room, Tues & Thurs, 3pm, McCormick Green Lge; intermed, Mon, 6:30pm, McCormick Green Lge. Enis Singh Vluga, 436-3753.

Exhibitions

Photographs: Unknown Road
An exhibition of 84 photographs by members of Minor White's graduate photography class. Thru May 15, Creative Photography Gallery (120 Mass Ave.), 10am-6pm daily.

Photos by Donald Blumberg
Exhibition of portraits of students sponsored by the Committee on the Visual Arts. May 5-21, Hayden Corridor Gallery. Gallery is open all the time.

19th Century Italian Paintings
Paintings selected from American Collections. May 11-June 9. Mon-Sat, 10am-4pm, Hayden Gallery.

Music Library Exhibit
Photographs of early instruments up to 1600. Daily, Rm 14E-109.

Hart Nautical Museum*
Exhibits include "Ocean Engineering Summer Laboratory Projects 1971 and 1972," and "Tugs and Towing." Bldg 5, first floor.

Athletics

V Tennis
Amherst. Wed, May 9, 4pm, duPont Tennis Courts.

JV/F & V Baseball
Trinity. Fri, May 11, 4pm, Briggs Field.

MV Sailing
NEISA Single-Handed Championship. Sat & Sun, May 12 & 13, 10am, Sailing Pavilion.

Rugby
New England Rugby Tournament. Sat, May 12, 1pm. Briggs Field.

WV Sailing
CCT Invitational. Sun, May 13, 9:30am, Sailing Pavilion.

V Baseball
Bentley. Tue, May 15, 4pm, Briggs Field.

JV/F Lacrosse
Moses Brown. Wed, May 16, 3:30pm, Briggs Field.

JV/F Baseball
Milton Academy. Wed, May 16, 4pm, Briggs Field.

Religious Services and Activities

The Chapel is open for private meditation from 7am to 11pm every day.

Campus Crusade for Christ/College Life*
Family time, fellowship and teachings from God's Word. Fri, 7-9:30pm, Rm 1-132.

Christian Bible Discussion Group*
Thurs, 1pm, Rm 20B-031. Call Prof. Schimmel, X3-6739, or Ralph Burgess, X3-2415.

Christian Study Group
Meeting to study God's Word and the lives of Christian men. Sun, 9:30am, McCormick Green Room. For information, 494-8778.

Christian Science Organization*
Tues, 7:15pm, Rm 8-314. Meetings include testimonies of healing.

Divine Light*
Discourses on the knowledge of Shri Guru Maharaj Ji. Mon, Wed, Fri, 7:30pm, Rm 4-159.

Hillel Services*
Mon-Fri, 8am, Rm 7-108; Fri, 8:15am, Chapel; Sat, 9am, Chapel.

Hillel Classes
Hebrew, Wed: Beg 6pm; Intermed 5pm, Rm 1-203; Adv 1pm, Rm 5-231. **Basic Judaism**, Kathy Green, Wed, 8am, Hillel Library. **Yiddish**, Thur, 7pm, Rm 1-242. **Mekhilta** lectures, Fri, 12n, Hillel Library. **Talmud**, Beg, Mon-Tues, 8pm; Adv, Sun, 12n, Wed, 8pm.

Islamic Society*
Prayers, Fri, 12:15pm, Kresge Rehearsal Rm B. Discussions on the Qur'anic interpretations of various aspects of life, Sat, 4pm, ISC Lounge, Walker 2nd floor, coffee served.

Protestant Worship Service*
Sun, 11am, Chapel.

Roman Catholic Masses
Masses: Sun, 9:15am, 12:15pm, 5:15pm; Tues, 5:05pm; Wed, 4:30pm; Fri, 12:05pm. Chapel.

Vedanta Society*
Services, Fri, 5:15pm, Chapel. Followed by discussion hour, 5pm, Lobdell Dining Room.

Westgate I & II Bible Study
Wed, 8pm, Westgate I, apt 1202. For information, 494-8405 or 494-8778.

United Christian Fellowship*
Christians for dinner, food, fellowship. Wed, 5pm, Walker (at sign of the fish). Followed by singing, praying, sharing meeting, 6pm, Rm 14E-303.

Zen Society*
Meditation meetings. Mon through Fri, 8-9am, Chapel. Call 492-4945.

Announcements

Registration for the Centennial Convocation
Weekend of panels and workshops covering issues of current and future international and national concert, as well as questions relating to career selection, education and personal development. Sat-Sun, June 2-3, Kresge. Registration, including meals, \$30. Information, Alumni Association, x3-4875.

Dormitory Council R/O Planning
Volunteers are needed to help out during the 10 days prior to fall registration day. If you are returning early and would like to assist at the inter-dorm level, please contact Bob Greenberg, x8539 Dorm.

Charity Donation Experiment
MIT employees are needed to fill out questionnaires about their activities in behalf of charity. \$2 compensation for 1 hour participation. Thurs, May 10, 5:15pm. For information and appointment, call Jack Levy, 494-8652.

Great Boston Kite Festival
Sat, May 19, Franklin Park. Help needed with kite clinics in Boston neighborhoods on Sat, May 12. Call Ted, x3-4160.

6.714 Strobe Project Lab
Sign up for Fall 1973 in Rm 4-405 thru Fri, May 18.

Dining Service

Wed, May 16
Lunch: Macaroni beef and tomato
Dinner: Mason/Dixon Nite
Thurs, May 17
Lunch: Shrimp foo yong w/rice
Dinner: Roast turkey w/dressing & gravy
Fri, May 18
Lunch: Swiss cheese croquettes w/sauce
Dinner: Seafood cakes w/tartar sauce
Mon, May 21
Lunch: Italian spaghetti w/meat sauce
Dinner: Chicken marengo
Tues, May 22
Lunch: Cottage chicken
Dinner: Breaded pork chop w/applesauce

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 May 16 through May 25 to the Calendar Editor, Room 5-111, Ext. 3-3279, before noon Friday, May 11.

The Door Prize Was 'Up, Up and Away'

There are door prizes—and there are door prizes.

And true to the tradition of daring young men (and women) in flying machines, the Department of Aeronautics and Astronautics came up with something special for its Spring Picnic on Saturday, April 28.

The prize, for five of the guests, was a ride in an executive jet airplane—in this case, one of Cessna Aircraft Company's \$750,000 twin-engine Citations.

The reaction from the winners: "Just one word—Wow!," said David B. S. Smith, one of the student organizers of the picnic.

The ride was such a hit that some extra flights would have been made, he said, except that Cessna people had to dash back to Wichita, Kansas, where the company has its headquarters, for a dinner engagement.

About 100 persons attended the picnic, held at the Draper Flight Facility at Hanscom Field in Bedford. It was arranged by the department and by the student chapter of the American Institute of Astronautics.

The organizers had invited any interested MIT freshmen to the activities—28 of them were present—to give them some idea of the department's offerings and the challenges in the aerospace field.

The displays included the MIT student-built man-powered aircraft, The Burd, a glider, an Army Chinook helicopter, and several light airplanes. For those who missed out on the ride in the executive jet, flights were available in the other planes.

The freshmen guests had a chance to talk with Course XVI sophomores, juniors and seniors in the aeronautics and astronautics

department, along with a number of special guests.

These included Philip Chapman, an astronaut who is a Space Shuttle candidate; Arnold D. Aldrich, program manager for the Skylab program at the Manned Spacecraft Center; Brig. Gen. Robert A. Duffy, president-elect of the Charles Stark Draper Laboratory; Charles L. "Chip" Collins, manager of the Draper Flight Facility at Hanscom and a test pilot, and James Taylor, vice president of the Cessna Corporation.

As part of the program, Chapman, Aldrich and two student organizers, Val M. Heinz and David Akin, appeared on a "talk show" on radio station WEEI.

The student organizers and the departmental advisor, Professor James W. Mar, said they hoped to make the Spring Picnic an annual activity.

11 MORE STOLEN

Despite New Thefts, Bike Haven Not Full

The Institute's new enclosed bicycle parking lot opened about a month ago but is not being used to capacity despite continued thefts elsewhere on campus.

Captain James Olivieri of Campus Patrol reported that about 60 bicycle owners use the free parking lot each weekday. The lot has an 80-bike capacity, which can be doubled by installation of more bike stands.

Bicycle thefts are still prevalent, Captain Olivieri said, especially from the bike stands in front of the Student Center. "Eleven bicycles have been stolen since the guarded lot opened. These thefts could have been prevented if the bike owners had used the enclosed parking lot," he said. "It's guarded by student attendants from 8am to 7pm Monday through Friday and after hours it is locked and checked regularly by Campus Patrol."

The bike lot is centrally located under the south portico of Building 13 facing the courtyard near the Medical Department. To ensure security, a check-in/check-out system is being used. When a bike owner parks his wheels, he is given a numbered chit, half of which is tied on the bicycle. To retrieve the bike, the owner must turn in his half of the chit.

After 7pm or on weekends the Campus Patrol may be summoned to unlock the parking lot. An Institute telephone in the guardhouse just outside the lot is available for this purpose.

The bike park, which was opened as a pilot program, is expected to operate through the end of Spring term. If enough interest is shown, the lot may be increased in size and remain open during the summer.



These bikes all in a row in the Building 13 bicycle enclave are safe from theft. There is room for more.

A Caribbean Curry From Matrons Gourmet Club

Members of the Technology Matrons Gourmet Club meet once a month for a luncheon feast, sampling exotic international cuisine. Last month they gathered for a Caribbean luncheon prepared by Mrs. Cynthia Frailey, Mrs. Nancy Slattery and Mrs. Mary McClintock. The following recipe is a sample from the luncheon menu.

SEAFOOD CURRY

- | | |
|------------------------|--|
| ¼ lb. butter | 2 tbs. flour |
| 5 onions chopped | 2½ cups milk, or combination milk and shrimp stock |
| 2 cloves garlic | 1 lb. combination cooked shrimp, lobster, crabmeat |
| ½ tsp. cumin seed | 2 tbs. lemon juice |
| 2 tsp. powdered ginger | 1 tbs. plum jam or chopped chutney |
| dash cayenne pepper | |
| 2 tsp. salt | |
| 2 tomatoes, chopped | |
| 2 tbsp. curry | |

In butter, saute onions and garlic 10 minutes. Add seasonings and tomatoes. Cover and cook over low heat for 10 minutes, stirring occasionally. Add flour and cook for two minutes. Add milk and bring to a boil. Add seafood, lemon juice and jam. Heat until warm. Balance seasoning—curry should be slightly sweet-sour.

Serve over rice with assorted condiments of cocoanut, peanuts, mango chutney, fresh pineapple, crisp bacon, chopped onion in sour cream, toasted almonds, raisins, chopped dill pickle, pimento and citrus sections. Serves 6.

MIT Symphony On Channel 2

WGBH-TV (Channel 2) will make two broadcasts of a special videotaped concert by the MIT Symphony Orchestra at 8pm Sunday, May 13, at 9:30pm Friday, May 18, and at 4:30pm Sunday, May 20.

The concert, conducted by David Epstein, was presented specifically for videotaping on April 3, the day after the orchestra returned from its successful national concert tour. The program for the hour-long concert consists of two works performed on tour, Two Nocturnes by Debussy and Symphony No. 2 in D Major by Brahms.

CLASSIFIED ADS

Ads are limited to one per person per issue and may not be repeated in successive issues. All ads must be accompanied by full name and Institute extension. Only Institute extensions 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, May 11.**

For Sale, Etc.

Wicker writing desk, \$30; oak crib & matt, \$35; map bkcase, \$30. Noel, x3-6803.

Guitar, 12 str elect or accoustical, \$125 but a little flex. 536-3981 morn or late evgs.

Dynaco stereo 70 amp, \$60; PAS-3 pre amp, \$35; GE port stereo, \$30. Dick, x3-4170.

Vox super organ, \$699. Mark, x3-7836.

Cello, ¾ sz, v gd cond; fold-up ping pong tbl, v gd cond; 16mm movie camera, Bell Howell, filmo DA 70, old mod but exc cond. Edgar, x3-3636.

Oscillating tbl fan, 10", \$11. Louis, x8605 Dorm.

Twin bed, exc cond, \$45; ch of drwrs, \$30. Eileen, x3-5358 or x8822 Dorm.

New ladies shoes, 2 pr of flats, 7½ s, navy & bone; sgl used matt, \$5. Paul x401 Linc.

Smith Corona, prot, typewrt, 88 char key bd, v gd cond, \$50. Mario, x3-1741.

KLH 41 t deck w/Dolby, 1½ yrs, Scotch 150 tape, slightly used, best offers. x3161 lv mesg.

Gdyr polyglas, 4 tires, H-78x15, almost new, \$70. Nelson, x3-6468.

Sears 12" radial sqw, \$250; scuba tank & regulator, \$100; 650 X 13 wht w Bs, \$15 pr. Duncan, x8-1579 Draper.

USAF mess dress uniform, 41 L; B&W jackets; AF mess hat, 7¼ accessories. Peter Allman, x3-1448.

RAleigh womans 3 spd, yr old, exc cond, orig \$125, now \$70 or best. Louise, x5888 Linc.

Gr tweed 9x12 rug, gd cond, \$15, sm wooden bkcase, \$10. Elaine, x7368 Linc.

Gerrard SL-65 B, turntbl, base & dust cover, Shure M 55 E cart, w/new stylus yr old, \$45. John, x8-1524.

Pr spkrs TDC IV, 2 way, 7 mos old, 5 yr warr still gd, orig carton, exc cond, \$70 p pr. Tom, x8521 Dorm.

Gdyr 6.50x13 on rims, 1 new, \$15pr; 115/230 elect motors, ¾, ¼, 1/6 hp, overhauled, \$15, \$10, \$8. 782-2373.

Tbl saw, 10" craftsman, w/V dado set, tbl extension, 4 legs, motor, \$150. Dave, x3-7529.

Electronic equip. Jim Evans, 494-8414.

Shetland Lewyt vac clnr, \$15; humidifier, \$12; baby stroller, \$15; GE clock R, \$6; Sears Kenmore iron, \$4; Automatic toaster, \$4; sm lamp, \$2; Singh, x3-7796.

Realistic AM/SSB 23 chan CB transrcvr, mod TRC 46, retail \$330, new, nvr used, now \$175. Donald, x8-3333 Draper.

Suitcases, \$3ea; custom md, lined drapes \$10 p pr; lg tricycle, \$6; child's tractor & trlr, \$12; red bedspread, \$5. Gundersen, x3-6085.

Abc & Fitch golf shoes, nv used, sz 6, \$20. Nina, x3-7400.

Antique arrow bk Windsor chr, blk w/stencils, \$40; gr china dishes, approx 8 pl sets, \$7.50. Jim, x3-2173.

Free tubeless tire, 5.60-15, fits Volvo. Chris, Arterton, x3-3120.

Antique Empire chest on chest, orig brass poles, nds refinish, \$115. x3-7906.

Scott's silent mower, w/catcher, exc cond, \$20. Bob, x5892 Linc.

Danskin ribbed pants, sz 9/10; pr navy & pr wild grape, both worn a few times, exc cond. \$7 ea or both \$13. Helen, x3-2957.

Pr Tiger Marathon racing flats, sz 9½, worn and raced only once, \$11; chain 3/8" thick, 5' long, neoprene coated, \$8; slide rule, Post 1445, \$2.50. Richard, Amato, x3-3161 lv mesg.

Port stereo console, solid st recd player, \$30. Mike, x8-3388 Draper.

Gdyr polyglas, C-78-14, used less than 3 K, 2 pr at \$25. 646-0167.

Farfisa combo compact organ, 15 music stops, echo, vibrato, 2½ yrs old, \$375; '63 Pont Catalina, 76 K, \$350. 494-9142.

Blk vinyl rocker & ottoman, \$45; red & wht dresser w/mirror, match chest drwrs, 2 nig tbls, \$75; humidifier, \$15. Terry, x3-7007.

Danish DR tbl 51x33, ext to 91x33, \$45; formica wood tbl, 46x35 ext to 60x35, \$35; 2 twin sz beds w/matts, \$60 w/hdboard, \$50; rug, blue 15x11, \$40; sm tbl 29x29, \$20; grey armchr, \$40; child's tbl w/2 chrs, \$10. Fubini, 739-1181.

GE refrig, 6 cu ft. Dennis Dubro x3-3161 lve mesg.

Guitar, class, Guild Mark I, mahag, exc cond, 5 yrs, \$100 w/case. Evelyn, x3-1944.

Waterrest wat bed, 6x7, k sz frame, heater, auto thermostat matt, liner, \$100. Dana, x0589 Dorm.

Olympus camera, 35 sp, f/1.7 w/case, \$65. Kai, 491-4377.

Scott 299 F amp, \$70; materwork t player, port, \$50. Anita, x3-2049.

Men's 3 sp bike, blk, v gd cond, w/baskets, \$40. Ziggy, 536-5497.

Lejeune r bike; rolleiflex; vac cleaner; toaster; misc items. Samer, 547-4777 evgs.

Stereo FMAM recvr, Garrard tntbl & 2 sm spks, exc cond, \$70. Peter, x3-7530.

Alum ladder, minimum 22'; used trailer. Rachel, x3-2285.

Camera, 4x5 Sp Graphic w/Polaroid back, flash, 20 holders, \$175, opt Titan tripod, \$35; '64 Peugeot, std urns well, new snos, \$125; used Wilson T racket, \$10. Wanted: '64 or '65 Chevy Nova auto; Pentax body w/or w/out 50mm lens; girl's 3 sp bike. Mindy, 864-2812.

Sears Kenmore vac cleaner, 1/3 hp, 2 yrs, exc cond, \$10; Sears 7'x7' umbrella tent for 4 persons; screen door & rear window, canopy, poles, carrying case, used 5 times, perf cond, \$25. Abraham, x5846 Linc.

Gossen sixicolor color correction lt/meter w/8 Tiffen series 7 decaired filters, cases, instr, \$40; calumet cc-401 4x5 view camera w/case, lens boards, ext rail, \$100; st wheel krok lok, \$2. Hank, x8-2781 Draper.

C c skis, Asnes, 150cm, w/cable bndgs, poles, \$10. 734-7975.

Kenwood 4140 AMFM stereo recvr 24 watts, RMS/chan into 8 ohms, 11 mos old, exc cond, new \$300; now \$200; pr EPI 100 spkrs, 8 ohms, 11 mos old, fair traded new \$180, now \$125/pr. Mike, 247-7790 evgs.

Cherry drop leaf tb country tbl, 150 yrs old, hand turned legs, 44x52 extended, 16" leaves, \$150 asking. x3-3502.

Refrig, gd cond, \$30; plus ice trays, ext cord; hot plate, continuously variable, 1 burner, exc cond, \$11; 1½ qt pot, \$7; 8" skillet, \$2; asst utensils, plates, cups, silverware, best offer. Wayne, x8405 Dorm.

Mahog Duncan Phyfe tbl, 42x60 96" w/3 leaves exc cond; 6 ladder back chrs; Monticello reprod mahog hinge top card tbl; hrd wood bkcase w/glass dr, 5 shelves; antique painted chr, rush seat; 7' couch w/end corner; pr of 54x81 inner spring matt, lk new. 484-0750.

Dish washer, \$75; GE washer, \$125; GE dryer \$125; many other items of furn. Corrado, x3-6743.

Sears Kenmore washer, \$75. 868-6598.

New polyglass whtwall, 700-13, inexpensive. Michael, x8529 Dorm.

Profess quality port open reel t recrd, 7½ & 3¾ ips, orig \$160, now \$25. Dean, x3-6306.

Ampeg Gemini guitar amp, exc cond, \$100. Joel, x3-4524.

Super takumar, 150mm f/4, case, hood, and caps, exc cond, \$80. Harry Wong, x3-2105.

Full sz freezer; sew mach; walnut desk w/formica top; 1 spd girl's bike; port stereo; out/d furn; 2 big bkcases; rcd tbl; asst lamps; 2 outd grills picnic equip, thermos jugs, alum clothesline; piano music; child games. 527-0466.

Sofa bed & match chr, \$45; coffee tbl & 2 end tbls, \$10; sm bkcase, \$5; sm D tbl & 4 chrs, \$20; 12x12 org shag rug, \$50; 10x12 gold rug, \$30; Norge a c, less than yr, \$120; mod lamp, \$15. Hal, x3-3472.

Extension ladder, 32-36' reach, wooden, \$5; K map set, tbl and 4 chrs w/2 end extensions, \$5. Ed, x3-5778.

DR tbl w/4 chrs, gd cond, \$30; Jim, x5884 Linc.

Vehicles

'64 Plym Sport Fury, red, 2 dr ht, w/blk int, auto, flr shift, p st, V8, retune up & oil change, almost new batt, alternator, regulator, v reliable. Jon Schweizer, 536-0345 evgs.

'64 VW sedan, w/'65 eng, sunroof, gd cond. Steven, 277-2992 evgs.

'64 Chevy Impala, auto, p st, rungs gd, but burns oil, \$50. Wade, x425 Linc.

'64 Dodge Dart GT, ps, R, 4 spd, Hurst, 6 cyl, gone many mi, body bad, runs v well, many new parts, gd T. \$100 or best. Albert, 324-5433.

'64 Buick Spec V6, R, 4 dr, gd cond, best offer. Lillian, 643-4283 evgs.

'64 Valiant, 225 cu in, std, 4 lo m K tires, & snos., \$150. Mel, x5776 Linc.

'64 VW Beetle, 86 K, sunrf, rfrack, new clutch, runs, eng nds some repair, \$250. x3-3598

'65 Olds Delta 88 ht, 4dr, sharp cond, tint ws, p st & br, 425 V8-84K, exc tires, \$495 or best. Dennis, x8-3333.

'65 Rambler, 2 dr, auto, R, eng runs but terrible pick-up, take it away for \$50. E. Agro, x6155.

'67 Pont Ventura, 4 dr, p st, auto, \$450. Stan, x7677 Linc.

'67 Ford Galaxie 500, exc cond, snos, \$300 or best. Furn for all rms incl: DR set, \$40; dbl bed, \$40; child furn. Mr or Mrs. Gine, 494-8278.

'68 VW sqbk, mech v gd, \$700. Tim, x3-6752.

'68 Mustang, V8, 37 K, auto, p st, R, n new Sears radials, \$795 or best. '65 Olds 98, 71 K, auto, p st, & br, a c, new brakes, gd tires, gd cond, \$545 or best. David, x3-7807.

'68 Pontiac Catalina, gd cond, auto, 8 cycl, p st, gd tires, new batt, \$995 or best. Bill x102 Linc.

'69 BSA 441 cc Victor, exc cond, new piston, rings, valve guides, \$500 or make offer. Mark, x5420 Linc.

'69 Volvo 144 std tr, well maintained, no reas offer refused. Bill, x8-2588 Draper.

'69 Blue VW sed, rebilt eng, gd cond, about \$500. Lloyd, x7518 Linc.

'69 Ford Chateau, 8 pass van, for work & play, auto, 6 cycl, exc cond, new tires, FMAM R, lg hter, \$1,850. Hoenig, x3-5503.

'69 VW bug, auto, 40 K, \$700; Bcn Hill apt, studio, avail 6/1, \$235/mo. 227-9719.

'70 VW sq bk, immaculate, 30 K, 5 new tires, 2 snos, new batt, \$1,400. Klaus, 492-4282.

'70 Maverick, best offer. 494-8476.

'70 BMW, 47 K, auto. Ray, x3-4472.

'72 Hornet sportabout, bronze, 15 K, new tires & snos, FM stereo & t deck, \$2,295 negot. Paul, x5880 Linc.

'69 Norton Commando S, 750 cc, v gd cond; rebilt, 30 K; Altec Lansing Voice of Theater spkrs. 547-6217.

Honda CB 450, nds wk on pistons, cyls & cams, exc bike when running, \$250. Mike, 494-9175 evgs lv mesg.

Fiberglas sloop 14', Tanzer w/trlr, \$1000. Lew, x671 Linc.

'71 tent trlr, Adventurer, slps 6-8, ht h t, exc cond, sp tire, D tbl, \$750. John, X3-2562.

Housing

Allst, lg sunny BR, LR, K, 6/20 sum sub w/opt, n T, \$165/mo incl ht. Christine, x3-3730.

Bcn Hill, sum sub w/opt, 5/23 duplex, 2 BRs, LR, DR, w/2 frpl, some furn, \$275. Steve, x3-4944 or 742-6739.

Bcn Hill, sum sub, 6/16-9/1, 2 BRs, DR-K, \$200/mo. x3-3579 or 723-6661 evgs aft 9pm.

Belmont, 4 BRs, on water, w/priv dock, \$60,000. X3-4141.

Billerica, on Bedford, Billerica line, lg 8 Rms, split level, ¼ lg BRs, 3 B units, lg LR, formal DR, eat in K, family Rm, 2 frpls gar, ¼ landsc acre, lo \$40's. Brian, x5326 Linc.

Bost, Kenm Sq, 1 BR, furn or un, a c, w w carp, sum sub w/opt. avail now, rent negot. Bill, x8-4048 Draper.

Bost, n BR on Bcn str, sum sub 3 BRs, sunny, spacious, clean, n T & Riverway park, \$265/mo. 267-8622 keep trying.

Bost, sub spcs 4 Rms apt, K, furn, 5 min fr T, 15 fr MIT, \$130 + util, \$60 off 1st mo rent. Insp Wed & Sat, 6-10, 58 Westland, Apt 9, Bost.

Bost, 2 N BRs, mod K, LR w/frpl, w carp, a c, n MIT & T, 6/1, \$250. Lawrence, x3-6834.

Bost, mod BR duplex in S. end, dish/whr, spiral str case, priv garden, quiet dead end st, 6/1 or 6/15. Jan, x3-1676.

Bost, Marlborough St, studio, 15 m to MIT, \$145/mo. Dick, x3-5940.

Bost, Marl St, n Copley sq, 15 min to MIT, BR, LR, K, B, sub fr 6/1-8/31, extension possible. \$150 incl everything. 536-6203.

Very lg 3 BRs sum sub, n Kenmore Sq, w/a c, util incl. \$315/mo. 536-7455 aft 5 pm.

Bost, bk bay, Fens, sum sub w/opt, 5 BRs, eat in K, w w carp, n T, \$290/mo. Dennis Lynch, 890-3200 days or 262-2846 evgs aft 11pm.

Bost, Fens area, studio sum sub, \$105/mo. Tom, x8-1272 Draper.

Bri, off Comm Ave, apt sublet 7/1 w/opt, 2 lg BR, panelled LR, hall library, huge K w/pantry, windows galore, pking, pets ok, \$225 + utils. Diane, x3-5691.

Camb, 3 Rms, htd, \$140/mo. Tom, x3-6734.

Camb, sum sub 6/1-8/31 w/opt, 4 BRs hse, n Harv Sq, furn, LR, lg K, DR, porch, \$350/mo + util. David, x3-2066.

Camb, 2 BRs, a c, frpl, w w carp, LR, new K, \$250/mo all util incl. Jim, 492-2649.

Camb, Eng, we have: hse n edge of village convenient to University, n shops & T, new 3 BRs hse, w w wool carp, dbl stove, lg freezer, d/washer, ht; would like similar here in exchange, avail 9/73-8/74, car by arrangement. David, x3-2082.

Camb, avail 6/1, 3 BRs, lg K, LR, n MIT, \$235/mo. '60 Rambler Amer, gd basic cond, \$60; turntbl, tuner spkrs; stereo hi fi, \$150. Robert 492-4282.

Camb, BR, plus basement, n Harv Sq, compl furn, ideal location, 6/1 opt to renew, \$175/mo. Peter, 354-0741 evgs.

Camb, BR apt, rec renovated, reas rent avail immed; Melrose, BR apt, reas rent, avail 6/1, pking. x3-1805.

Camb, sum sub, Mt Auburn st, BR studio w/k, LR, B, furn, 6/1-9/1, \$150/mo. 876-8168 m & evgs.

Camb, Huron Ave, garden apt avail 6/1, LR, BR, K, B, study alcove, furn, \$210 incl util. Mrs. E.C. Simpson, 864-4254 evgs.

Camb, betw Harv & Inman, 2 BRs, LR, K, off str prking, v gd landlord, avail 5/19, \$215 incl ht. x3-4571.

Camb, North, 4 Rms, good cond, quiet, n T, avail now. 547-1284.

Camb, sm apt w/BR, \$130. Jerry, x3-7173 betw 12n-1pm.

Needham, sum, 3 BRs, cape hse, 6/23-9/4 flex, \$600 season. Travis Merritt, x3-2408.

Newton, mod 2 BRs, avail 6/1, w w ac, pking, \$245 incl everything. Bill, x3-6853.

Som, Ten Hills, nice neighborhd on Mystic Basin, n ele school, 2 BRs, DR, LR, w/frpl & carpet, mod K, garage, 7/1, \$250/mo. Bill, x3-6221.

Som, 4 BRs, K, n Harvard/Inman, 6/1 sub w/opt, \$325/mo. Ray, x3-3857.

Watwn, new brick duplex, a c, 3 BRs, 1½ B, mod tile K, DR & foyer, lg LR, vacuum, fire alarm, sprink sys. Ted, 924-7950.

Wayland-Lincoln line, lge contempor hse, 4-5 bedrooms, wooded lt, 30 min to MIT, avail 6/20/73-9/1/74, \$575/mo. x3-6809 or 1-358-4698.

Woodlawn-Chelsea, 2 apts: 4 Rm, w w carp, comp renov, w/patio yrd, n shop & T, references and sec dep, no pets, \$185/mo inc util; 3 Rms plus finished attic, w w carp, patio yrd, clean, no pets, \$150/mo Tony, X5713 Linc.

Eastgate apt, sub 6/1-9/1, furn. Call 494-8729.

East/Westgate apt needed for visiting couple fr 5/27 or 28 thru 6/1 or 2. 494-8349 evgs.

Westgate II, sub w/opt, 18th flr view to s, west, studio, K, & LR, avail 6/1, \$109/mo. ½ sz refrig, in gd cond, \$20. 494-8993.

Westgate II, sum sub, view of Charles, 3 BRs, furn, affiliation w/MIT necess. 494-9167.

NH, on Squam Lk, 2 BR cottage, peaceful lk, sand beach, mt view across vater. x3-1842.

Conway, NH, lg contemporary lodge, 4 BRs, frpl in LR, 2 B, playrm, sun deck, patio w/screen, mt view, n priv beach, season mo or wcky rental. x3-4291 & x3-4916.

NH, 1½ acres in Wakefield n lk and skiing, \$3,500. Caroline Stitson, x3-6966.

NH, on Sunrise lk, for sale, fully furn 4 seasons chalet, newly blt. Mrs. Lima, x3-2741.

Bridgeton, Maine, beaut lg chalet, all conveniences, slps 12, 4 BRs, LR, frpl, 2 B, sundeck, hking, swim, canoeing incl w/hse, 14 acres of forest & mts, compl priv, avail 8/18-Labor D. x3-5503.

Maine mt chalet, 3 min to lk, new, 3 BRs, compl equip, \$425/per wk. Bill, x181-523581.

Moose Pond, Maine, chalet rental, n N. Conway, NH, lkside, new 3 BRs, w w carp, slps 9, \$160/wkly. Ruth, x8-2476.

Animals

Affect young m Siamese, free to gd home, hates other cats. Jim, x3-1926.

Free puppies. Jackie, x7720 Linc.

She Siamese, 7/mo seal pt, free. Neal, x9519 Dorm.

Siamese kittens, \$10 ea. Frank, x3-2091.

Pr of sm adult, 1½ yrs, blk & wht fem cats, spayed & lovable, must give away due to residence problems. 625-7196.

Lost and Found

Found: Apr 28, m Germ shep, MIT campus, blk & tan. 494-9045.

Lost: prescription sun glasses, gold fr, w/out case. Chris Herot, x3-7920.

Wanted

Ride to Woods Hole, Fri, May 11, ret Sun, May 13, wl help w/expenses. x3-3279.

Rmmate to shr, Camb, a c mod furn 2 BRs w/one other male, \$125/mo. w/free telep & util. Anand, x3-7537.

Rmmte, for 2 BR thwse apt in Waltham, swim p, tennis courts, a c, \$100. Dave, x8-1564 Draper.

Rmmate, male, to sum sub, gd apt in Brkln, n T, 6/1-8/31, \$80/mo. John or Hy, 232-7959.

Quiet, resp prof woman seeks attic apt, pref hse in Camb or environs, for long-time lease, reas rent. Sally, x3-3270.

Garden apt or furn hse for mature woman and daughter, beg 6/15. 244-1238.

Child's bike for 4 yr old, w/training whls, and coaster brake; 2 adult sz bikes, pref 3 spd & cheap. Jack, x3-3903 bef noon.

Ride for luggage to Balt, Md., 5/18-6/1, wl pay. Sonney, x8564 Dorm.

Ride fr Melrose to MIT campus. Bob, x3-3697.

Ride to either Fayetteville NC via I-95, by 5/17 or Gatlinburg, Tenn by 5/18; ret fr Brunswick, Ga to MIT early June, wl shr exp. Kathy, x3-1637.

Rmmate, 1 or 2, for lg BR of 2 BR apt on Marl St, furn, clean, sunny, gd landlord, avail 6/1-9/1. \$140/mo inc util. Kathy, x3-2701.

Rmmate for apt n Radcl, pref grad or staff, \$80/mo. Mark, x8-1387.

Appalachian boy nds graduation clothes: dk blue pants, 33" waist, 30" leg, lgt blue shirt sz 14½, blue stripe tie, can you help? x3-4105.

Own BR in 2-3 BR apt in Westgate II, beg 6/1 w/opt for 9/1. Girdhar, 491-7568 evgs.

Cheap AMFM R, also he cheap hd/phones. Ginny, x3-2380 lve mesg.

Person to accompany 5 yr old child on plane to Port, Oreg, around 6/2, wl pay part fare of chaperone. Nancy Hoffman, x3-6952 or 723-8390 evgs.

Rmmate, for Camb, sum sub, to shr meals & garden, \$57/mo. Gae-Tan, x3-6394.

Used a c, 11 thou BTU, 22 thou BTU. Chris, x8-2826 Draper.

Daily ride fr Medfield-Millis to Draper, hrs flex. Tom, x8-3987.

Female rmmate for 2 BRs apt, w/own rm, v nice clean apt in Bcn Hill, fantastic view, 2 blks Chas St. sta, \$110. Barbara, 723-6121 evgs.

Rmmate for sum sub, rm in Central sq on Main st, gas & water, K, LR, dbl B. Manuel, 868-8331.

Apt for 9/1, n MIT, BR, w/util, ht, pking. Espinosa, x3-1477.

Rmmate for sum sub, in Westgate II, w/3 other rmmates, rent negot. 494-9231.

Ride fr MIT to Linc Lab & back, working days, 5/29-8/17, wl pay. Dana, x0589 Dorm aft 3pm.

Notes from 8.20 course fr someone who has dropped the class; Prof Buechner has no more copies. Ron Feigenblatt, x9252 Dorm.

Rmmate, 1, 2, and/or 3 people, sum sub in Camb, own Rms & LR in lg apt, n MIT, on 3rd str, \$85/mo incl util. Dave or Bob, 661-3197.

Male rmmate for sum sub w/opt, own rm, n Tech Sq, avail now, \$78/mo, negot + util. Mark, 868-4890.

Lady's bike, 3 spd, std, 26" wheel. Dr. Colton, x3-1555.

Used 10 sp bike. Fred Levins, x3-2871 mesg only.

Fem 3 sp bike, Schwinn or Raleigh, 19"-20" frame. Susan, x3-7922.

Rmmate, fem, for Bcn Hill apt w/2 others, June to Aug, w/possible lease renew. \$87/mo + util. Charlotte, x3-3210.

Miscellaneous

Wl do gen & theses typing. Nina, x8-3333 Draper.

Wood flrs, sanded, refinished, profess. Denny, x3-5606.

Typing of all kinds, fast, reas, pick up and deliv, IBM Selectric II. 284-5388.

Prof, exp editor wl edit theses, articles for publ, etc, all subj, reas. Marjorie, x3-2507.

Wl do gen & thesis typing. Marsha, x3-2342.

Positions Available

These are some of the new positions received since the last Tech Talk ad. The Personnel Office is seeking individuals from within the Institute to fill these openings. Other available positions are posted in the Personnel Office, E19-239.

DSR Staff Marine Liaison Representative will assist the project Advisory service Officer in planning, organizing, and implementing programs which will provide technical assistance to persons engaged in activities involving the resources of the coastal zone and the ocean; identify the problems and needs of the marine resources users and assist in the conduct of a marine extension program. The agent will travel as necessary to provide regular coverage to the marine community in Massachusetts and the New England Region. 73-358.

DSR Staff member will conduct economic analysis of experimental and proposed direct housing allowance programs in connection with a research program in urban studies, Ph.D., or equivalent in economics with specialization in the economics of urban housing is required. 73-348.

Administrative Staff member will work a Exhibition Manager and will be responsible for a wide range of creative and administrative tasks; will plan and stage exhibitions, maintain MIT collection, develop new exhibition programs. MA in modern art, minimum 2 years museum or gallery experience required. Available August 1st. 73-376.

Senior Secretary V will need excellent skills of typing and shorthand; ability and flair for writing is needed for proposals and publications preparation. Will execute some administrative details including maintenance of department budgets. Interest and knowledge of contemporary art desirable. 73-344.

Secretary IV or Senior Secretary V to the Director and Assistant director of an Interdepartmental Laboratory will type technical reports and journal articles. Occasionally coordinate office workload; handle all general secretarial procedures. Excellent shorthand and typing skills, 3-5 years experience and ability to learn technical typing required. 73-342.

Secretary IV will handle hourly and student payrolls for department, order supplies, type from rough draft and dictaphone. Good typing important, knowledge of MIT payroll systems helpful. 73-365.

Secretary IV in one-person office will work with a research group and a faculty member. Type scientific manuscripts, memos, reports and class materials; maintain budgets and petty cash. Good typing and dictaphone skills required; shorthand and previous secretarial experience an asset. 73-363.

Secretary III, IV will need technical typing, accounting, and organizational abilities for work in a small research lab in an Academic department. Heavy typing responsibilities. 25 hour work week/5 hours daily. 73-364.

Secretary III, IV will need good typing and dictaphone skills for correspondence to individuals applying to MIT. Maintain files and records; perform other varied secretarial functions. Business school training or previous office experience required. 73-362.

Accounting Clerks III, IV will handle a variety of duties: type reports and correspondence; prepare and chart budgets; tabulate research expenditures and cash flow; maintain files; handle problems and answer questions. Good numeric typing skills, ability to use the adding machine and calculator are important. Several openings require an accounting background and some experience, some others require a knowledge of bookkeeping. 73-352 to 357.

Secretary III will work in an Administrative office and handle routine secretarial duties: schedule appointments; type correspondence, minutes of meetings; handle other detailed secretarial duties. Ability to work with figures very important. 73-366.

Secretary III will take and transcribe dictation, type technical papers, perform general clerical duties, maintain files and records, schedule appointments. Previous experience or secretarial training needed. 73-360.

Senior Clerk III will be responsible for twice daily maintenance check of eleven rapid print copy machines at various locations at the Institute. Will replace paper; collect, count, and package coins from coin box; report malfunctions. Mechanical and mathematical ability needed. Will need a security clearance. 73-372.

Technical Typist III will prepare technical documents relating to computer programming, mathematics, and statistics. Set up and record original drafts. make corrections and produce final copy using MTST. Maintain library of storage volumes or computer files. Technical typing experience, ability to learn MTST required. 73-350.

Systems Programmer will work in the Program Development Office as a full-time Multics System Programmer. Two or three years experience with the Multics System and PL/1 required. Other experience in system design and programming desirable. 73-384.

For appointment please call x3-4251 The number after each job is for identification.

There's a Draper 'Lark' in Skylab's Computer

(Continued from page 1)

those, also from MIT, which successfully guided all flights of Apollo spacecraft to the moon and back.

Three crews, each consisting of three astronauts, will man the experimental Skylab space station in

1973 in what is to be the most ambitious and long-lived manned space research effort yet undertaken. Man will be taking a long, discerning look at the orb that is his home, measuring it a number of ways and deciding how he can improve life thereon. He will also be probing the sun, his ultimate

source of energy, to an unprecedented extent. And he will be looking inwardly at himself, evaluating his own ability to work and live satisfactorily in space over a long period.

During Skylab missions space engineers at the Draper Laboratory in Cambridge will again be

manning special telephone lines to Houston, Tex. providing real-time support for the astronauts in flight.

The Draper Lab, an independent division of MIT, has been prime contractor for design and development of the onboard guidance, navigation, and control system used in both the Apollo Command Module, (CM) and the Apollo lunar module since the beginning of the program.

In addition, the laboratory has developed—and verified by simulation using a mockup of the CM—the detailed step-by-step programs that are wired into the computer portion of the guidance system.

During each Apollo mission and during Skylab missions Draper teams work in shifts at the Mission Control Center at the Lyndon B. Johnson Space Center at Houston, Texas. At the same time, in support of them, Draper Laboratory engineers, scientists and programmers specializing in all aspects of the guidance system hardware and software are on standby call 24 hours a day in case they are needed by the astronauts in space.

Nerve center of the Laboratory during a mission is a classroom on the second floor of the Apollo building, 75 Cambridge Parkway, where small teams working around the clock in shifts remain in constant voice contact with the Mission Control Center.

During phases of the mission when the command module and the guidance system are "powered up"—such as in launch, rendezvous, docking, de-orbit, and entry—the Cambridge engineers receive telemetered data from the spacecraft having to do with the guidance system function and performance and they are able to monitor voice transmission between Houston and the astronauts. Shift teams know at all times where specialists from the Lab can be reached and can call any number of them in at a moment's notice.

One Skylab objective was to wring from the Apollo program the greatest possible benefit at the lowest possible price. An example is at the heart of the Draper

guidance system. Two instruments which were developed at the Lab in the middle 1950s became and still are reliable workhorses of the space program. The 25 IRIG (Inertial Reference Integrating Gyro) and the 16 PIP (Pulsed Integrating Pendulum) are mounted on a stable member within the inertial measurement unit of the command module. The gyros provide the necessary error signals to stabilize in space the orientation of the inner member by servo drives on each of three axes—while the accelerometers (PIPs) are sensing translational motions along the same axes.

Skylab imposed some new requirements on Draper engineers. The SKYLARK computer program was modified in several ways from the lunar programs to support such requirements as a minimum five-revolution rendezvous. This is the earliest rendezvous that can be performed with sufficient tracking support and is necessary to allow first-day medical samples to be placed in the orbital workshop freezer within 24 hours.

Also included in the SKYLARK program is the capability to control the docked configuration of the Command Module and Orbital Workshop using the digital autopilot in the CM onboard computer. This capability will be used for such tasks as orbital adjustment maneuvers or to arrest any undesired tumbling or rotations by the entire space station.

Next on ABC

"Facing the Consequences," the fifth in the MIT-ABC News television series, "What About Tomorrow?" will be seen on the ABC network at 10:30pm next Monday (May 14).

WCVB-TV Ch. 5 is the ABC affiliate in the Boston area.

The program deals with the social and economic consequences of technology and includes interviews with such MIT people as Dr. J. Herbert Hollomon, director of the Center for Policy Alternatives; Professor Erik L. Mollo-Christensen of the Department of Meteorology; and Paul D. Hinckley of the Draper Laboratory.

Obituary

John A. Little, 56

Private services were held Friday, May 4, for John A. Little, 56, of Old Marlboro Road, Concord, who died May 2 following a long illness.

A life-long resident of Melrose before moving to Concord a year ago, Mr. Little was a 1935 graduate of Melrose High School. He received the AB degree from Dartmouth College in 1939 and the master of commercial science (MCS) degree in 1940 from the Amos Tuck School of Administration and Finance at Dartmouth.

Mr. Little became a staff accountant with the Boston office of Lybrand, Ross Bros. & Montgomery in 1940. From 1941-1945 he served with the US Naval Reserve Supply Corps, both in this country and abroad. He was released with the rank of lieutenant commander.

Following the war, Mr. Little returned to Lybrand Ross Bros. & Montgomery. He became a Certified Public Accountant in 1948. In 1949 he was appointed as accounting officer at MIT.

In 1961 Mr. Little was appointed

associate comptroller of the Institute. He directed the budgeting, accounting and financial reporting for educational, research and administrative activities throughout the Institute. The MIT accounting and payroll offices were under his management.

Mr. Little was a member of the American Institute of Accountants, the National Association of Accountants and the Massachusetts Society of Certified Public Accountants. For a number of years he was a deacon and also chairman of the finance committee of the Melrose Highlands Congregational Church.

Mr. and Mrs. Little also maintained a summer home in Laconia, N.H.

Mr. Little is survived by his wife, the former Margaret H. Cowing, and three children, Mrs. Jo-Anne Prigmore of Guilford, N.H., William Geoffrey and Robert S. Little, at home, and one grandchild, Kristin J. Prigmore.

In lieu of flowers, contributions may be made to the MIT Cancer Research Center.

CRYSTALS FROM MIT LAB

Future Space Factory for Semiconductors Could Grow from Experiment on Skylab

(Continued from page 1)

will begin May 15, when they ride a Command Service Module similar to those used in the Apollo Program into earth orbit to rendezvous with Skylab, which will have been launched the day before. Skylab is about the size of a five-room house.

When the astronauts leave Skylab 28 days later (two other three-man teams will visit the orbiting space laboratory in August and in November), they will bring back to earth the three crystals originally grown at MIT for detailed study by Professors Gatos, Witt and their associates in their laboratory.

Crystal-growth is fundamental to the semiconductors, transistors, and other solid-state devices on which the modern electronics industry is based, but the growth process itself is still poorly understood.

"Many scientists regard crystal-growth as an art, not a science," Professors Gatos and Witt note. "Modern materials science has made great strides, but for the most part our accomplishments in the solid-state field are based on materials prepared through empirical knowledge rather than analysis."

Crystals gain their particular characteristics from the addition of carefully controlled impurities, known as "dopants," which are added to the molten material, or "melt," from which a crystal is grown. When a crystal seed is placed at the top of the melt, held below in a crucible, the new crystal begins to form as the seed is gradually raised, pulling the growing crystal up out of the melt until the desired length is reached.

In a gravitational field, density variations in the melt cause thermal convection, and this, in turn, causes irregularities in the distribution of the dopants in the growing crystal, often to the point of making the crystal worthless. It is this difficulty as well as the possibility of making crystals now impossible to produce on earth, that has spurred interest in investigating the effects of zero-gravity on crystal growth.

The three crystals of indium antimonide to be used in the Skylab experiment are five inches long and one-half inch in diameter and are encapsulated in quartz ampoules. They were painstakingly grown in Professor Gatos and Witt's laboratory to represent the best possible growth attainable in a gravitational field. While indium antimonide crystals have some important industrial applications, notably as magnetometers in what are called Hall devices, they were chosen for Skylab because of their similarity to other widely used materials combined with the experimental convenience of a relatively low melting point.

The experiment designed by Professors Gatos and Witt will take the Skylab astronauts about five hours to perform. The three crystals will be heated to approximately 600 degrees centigrade and under zero-gravity conditions the molten material, two-thirds of the original crystal, will be regrown in a furnace specially built for space conditions by Westinghouse to MIT specifications.

When brought back to earth, the crystals will contain a physical record of growth under both gravity and non-gravity conditions. Following their trip back to earth, they will once again return to the laboratory at MIT, where they will be exhaustively analyzed for numerous parameters, including the homogeneity of dopant segregation. Temperature data will be telemetered to the Manned Spacecraft Center in Houston during the experiment. This data will subsequently be used for the interpretation of solidification phenomena observed in the laboratory.

If all goes well, the "after" part of each crystal is expected by the experimenters to be clearly superior to the "before" section. Professors Gatos and Witt hope the experiment will demonstrate three clear advantages of processing electronic materials in space. These are, they write in a recent report: A) "Absence of gravity induced thermal convection should lead to essentially homogenous dopant incorporation and thus eliminate a major source of inadequate materials processing. B) "Suspending semiconductor melts by levitation techniques will prevent harmful contamination from crucible walls and permit the purer materials required by high efficiency devices. C) By establishing steep thermal gradients in semiconductor melts we will be able for the first time to produce extremely heavily doped materials, making possible solid state devices that cannot be produced on earth."

According to Professors Gatos and Witt, the NASA program has already helped put the "art" of crystal growth on a more scientific basis. In studies anticipating the Skylab effort, they write, "We have now developed a characterization procedure that, for the first time ever, permits unambiguous determination of cause and effect in the origin of major chemical defects in crystals. Results from the Skylab experiment—and certainly from the ensuing Space Shuttle program scheduled for 1979—will no doubt clarify many still existing questions—and the result should be that solid-state devices in the future will be both cheaper and better.

"If as expected, electronic materials processed in earth orbit are of superior quality, it is not inconceivable that space could be used as a prime factory for new and improved materials that could not be made on earth. Estimates of the economics of such a notion are quite attractive: it will cost approximately \$40 per pound to place material into earth orbit, while the going price for some special semiconductor materials now range as high as \$200 per gram.

"If we could one day produce and install in orbit solar cells of a quality and efficiency now impossible to attain on earth, large arrays of such cells could help suppress—or even avert—the energy crisis since electricity can be transmitted to earth by means of microwaves."

tration and personnel said:

"Our universities are being questioned by various groups about our missions, our use of resources, our tax exemptions and so on. One way of thinking about local universities is as economic enterprises and not enough is known about our collective impact on the local economy.

"Accordingly, this report on economic impact should be a useful complement to information now available on the programs and other locally important educational or community service functions of the eight universities involved in the study.

Findings of the survey are expected to be published in the fall.

Economic Impact

(Continued from page 1)

naires seeking information on their personal spending and banking patterns and real estate holdings. Similar information will be gathered on a sampling of MIT students.

In a cover letter accompanying the questionnaire, John M. Wynne, MIT vice president for adminis-