

# Welcome, Class of 1983

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**BEGINNING A NEW TRADITION** were members of MIT's football club who reported for practice on Monday, August 27. Intercollegiate football returned to MIT last year for the first time since 1902. Prospects for improvement over last year's 0-6 season look bright. See story on page 8.

## MIT Team Identifies First Double Quasar

By WILLIAM T. STRUBLE  
Staff Writer

A blurry double star image that some astronomers have thought could be a distortion caused by a massive cosmological "lens" has been scanned by MIT radio astronomers, who now believe the objects form the first double quasar ever found.

The conclusion of the MIT astrophysicists adds an intriguing new aspect to the study of quasars, or quasi-stellar objects, which are considered to be the most remote of the observable objects in the universe. Quasars look like stars when viewed through an optical telescope, but they emit more energy at radio frequencies than

the most powerful galaxies known. Scientists who had earlier used an optical telescope to study the twin images—which are designated 0957+561 A and B—had speculated that they might be seeing a single object split into a pair of images by a so-called "gravitational lens" between the quasar and the telescope. A massive galaxy could act as such a gravitational lens, refracting or bending the quasar's light in such a way that a single point of light would appear as two images. This is analogous to the bending of light as it passes the sun, a phenomenon predicted by Einstein and verified many times both by optical astronomers during solar eclipses and by  
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## UROP Offers Entree To New Researchers

By KAREN RAY  
Staff Writer

Ask a few students to make up a "Why I came to MIT as an Undergraduate" list. Doubtless, the opportunity to do research will be near the top of most of those lists.

While students at other universities must often wait years before doing research, dozens of MIT freshmen dive right in and, in fact, almost 20 per cent of students participating in the Undergraduate Research Opportunities Program (UROP) are freshmen. At any one time nearly two-thirds of undergraduates are involved in UROP.

Freshmen get involved in UROP for the same reasons as other students—to do research and get to know faculty members—but for freshmen there are other reasons for taking on a UROP project. First, UROP is one of the easiest ways to overcome large impersonal classes and feel like you belong somewhere, and second, getting involved in a research pro-

ject may tell you quickly if a particular field is right for you.

First let's talk to someone who was sure of what he wanted.

"I knew I wanted to study the physical properties of biological polymers," said new sophomore Miguel Mitchell, "and this project was a perfect fit, although it was in the Department of Nutrition and Food Science, and I plan to major in chemistry and mathematics."

Miguel decided early on a career in science and spent his summers while going to Boston Latin doing research work at Wesleyan University and Tufts University Medical School. Last spring Miguel began working with Dr. ChoKyun Rha, associate professor of food process engineering, on a project studying the flow of concentrated protein solutions under high shear stress, work that could ultimately have applications for designing artificial food and artificial skin.

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## Ready or Not, Here Comes '83

Some 1,070 members of MIT's class of 1983 are arriving in Cambridge this week in anticipation of Residence/Orientation (R/O) Week.

Forty international students checked in on Monday and Tuesday for a special three-day program of orientation to the Boston area, with trips planned to restaurants, stores, banks, museums and areas of historical interest in Boston and Cambridge. American students are expected on Thursday and Friday, August 30 and 31.

R/O Week actually lasts 10 days beginning with the Freshman Pic-

nic at 4:30pm, Friday, August 31, in Killian Court. (In case of rain the picnic will be held in duPont Gymnasium.) Immediately following the picnic, the fraternity rush marks the beginning of the first part of the program, when students will select their residences for the school year. On Monday evening, September 3, freshmen must turn in their dormitory preference cards at the R/O center, and housing for the coming year will be assigned on the basis of their choices. The fraternity rush continues through Friday, Sept. 7.

This year the R/O committee

has introduced two innovations to the program, both planned to make the period more productive for the arriving freshmen.

The first is a change in assigning temporary housing. In years past, freshmen have requested their preferred R/O week dormitory space upon arrival. This has led to much delay in giving out rooms. This year, freshmen mailed in their temporary residence preference cards in advance and will pick up their room assignments on arrival. The system will take much

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## Photovoltaic Radio Station Airs in Ohio

With the flick of a switch today (Wednesday, Aug. 19), the first commercial radio station powered by solar photovoltaic cells—cells that convert sunlight directly into electricity—will be put into operation in Bryan, Ohio, when daytime WBNO (AM) begins to draw its

power from an 800-module solar array. The utility connection which previously filled its energy needs with provide backup service.

Under a Department of Energy contract, MIT's Lincoln Laboratory initiated and designed the experimental solar power system.

At the heart of the system are 33,600 photovoltaic (PV) cells, which make up an array with a 15,000 watt peak power capacity.

Headed by Paul Maycock, the Department of Energy's Photovoltaic Systems Branch has a con-

## Chrysalis Takes To Air Via Human Power

(Bryan Allen, who achieved fame earlier this summer when he piloted and powered the Gossamer Albatross across the English Channel, visited MIT two weeks ago to try out MIT's human-powered airplane Chrysalis. The following article, written by Professor E. Eugene Larrabee of aeronautics and astronautics, briefly chronicles the history of MIT's person-powered flight).

By E. EUGENE LARRABEE  
Special to Tech Talk

The Chrysalis biplane is the third—and successful—human-powered airplane to be constructed by students at MIT. On August 17, Bryan Allen, who flew the Gossamer Albatross across the English Channel on June 12, flew MIT's Chrysalis airplane for the first time. He liked its stability and control and thought the power require-

ment to maintain flight (about one-third of a horsepower) comparable to that of the Gossamer Condor, predecessor of the Gossamer Albatross.

The student designers and constructors of the Chrysalis have enjoyed peer group relations with the designers and constructors of the Gossamer Albatross. Chrysalis uses airfoil sections developed by Dr. Peter Lissaman of the Albatross group while the Albatross uses a computer-designed propeller based on a program written by the Chrysalis group from principles developed by Professor E. Eugene Larrabee.

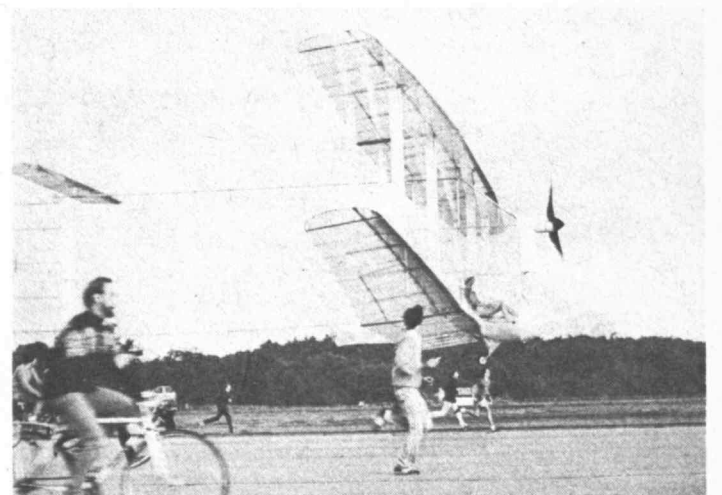
Bryan Allen's test flight of the Chrysalis is an aspect of the continuing interaction between the two groups that may one day lead to a new class of aeronautical recreation vehicles which would be to ordinary air-

planes as racing sculls are to motorboats.

The Chrysalis human-powered airplane is a conventional biplane with a 72-foot wingspan, an aft tail, a tractor propeller and an empty weight of 93 pounds. The Gossamer Albatross, by comparison, is a canard monoplane with a 96-foot wingspan, a forward pitch control surface, a pusher propeller and an empty weight of less than 70 pounds.

The relatively small size of the Chrysalis is a concession to the size of the Lincoln Laboratory hangar at Hanscom Field in Bedford where Chrysalis is stored. Its relatively heavy weight reflects the limited time available for its construction—the first week in March through the first week in June—which led to an alumni

(Continued on page 8)



Bryan Allen, who piloted the man-powered Gossamer Albatross across the English Channel in June, is at the controls—and the pedals—of MIT's man-powered craft, Chrysalis, in a flight at Hanscom Field in Bedford. Allen test-piloted the 95-pound biplane to help determine its maximum performance levels.

—Photo by Calvin Campbell



# UROP Offers Research Entree

(Continued from page 1)

"My sister went to MIT," said Miguel, "and it was from her that I first heard about doing undergraduate research. And when I was deciding what university to go to a prime factor in my decision was the opportunity to get actively involved in research right from the start."

Miguel spent this summer working with Professor Rha and will continue on the project during the fall term. In addition, this winter Miguel will begin his own research project isolating and studying magnetic micelles, colloidal or as-

sociative aggregates of certain detergents and water-insoluble particles isolatable with a magnetic field.

"I was particularly pleased with the lack of bureaucratic hassles," said Miguel. "And if I get tired of working here I can work in a totally different field, there are no rigid departmental boundaries for research." Miguel hopes to do graduate work in chemistry and then to do research in exobiology, the study of life beyond the earth. He is trying to gain broad knowledge in many areas of science since in exobiology research problems are

numerous and varied.

"It's incredible how much you can learn 'on the job,'" said Miguel. "I haven't taken any courses in physical chemistry and yet from my work I feel I understand the basics. When I get a chance to take P-chem, I will be able to appreciate it more and understand how it relates to other sciences."

"The chance to do research is one of the things which has made me fit in and feel at home at MIT."

Anne Serby entered MIT last year planning to major in biology.

"But after doing a little investigating I found that the biology here involves more chemistry and biochemistry," said Anne, "while I am more interested in physiology and learning how things work."

"That discovery, combined with a heavy load of large impersonal classes kind of got me down the first term. I'd heard about UROP but thought I wouldn't have enough time since I was also rowing crew. And I wasn't really sure if I could do it as a freshman, but during IAP I decided to try."

For her first UROP project Anne worked with Dr. Judith Wurtman, research associate in the Department of Nutrition and Food Science, on a study of estrogen in mice. She learned, quickly, how to give injections, operate on mice to remove their ovaries, and do the myriad of things involved in research with animals.

"The thing I really like," she said, "was being able to work with my hands. I was learning, but not just by doing homework sets."

"That was a short project and to coordinate the mice's schedule and my crew practice I often had to go to the lab at four in the morning!"

Anne, from Woodmere, N.Y., had always been interested in science and spent one summer working at Sloan-Kettering Memorial Institute for Cancer Research and much of her free time in high school doing projects for the science club and entering science contests. For her project with Dr. Wurtman, which ended shortly after the spring term began, Anne opted to receive academic credit. For the project she has been working on during the summer, with Dr. Ann M. Graybiel, associate professor of psychology and brain science in the department of Psychology, she is being paid. But because UROP is not designed just to provide summer jobs Anne has promised to continue on during the fall term.

"Now I think I've found what I want," said Anne. "I've decided to major in psychology."

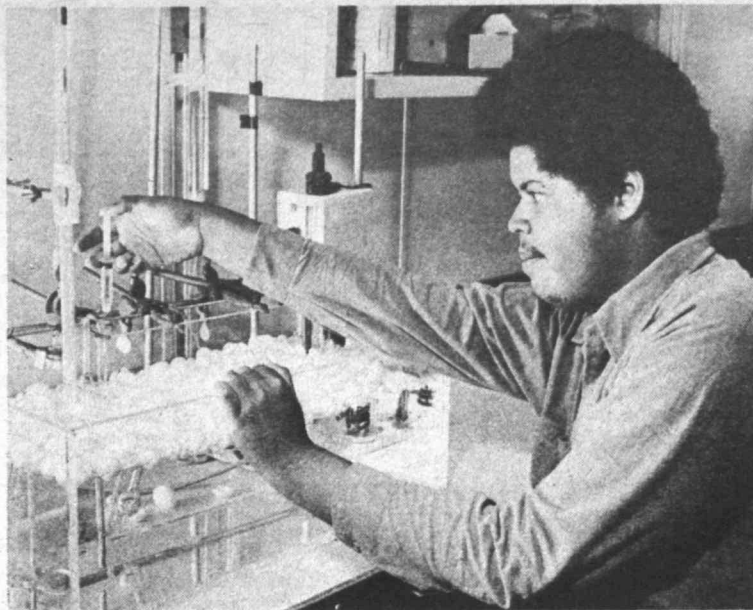
"I get to go to research seminars every Monday and the work that's being done here is very close to what I want to do." The project Anne is working on is a study of the role of acetylcholine, a neurotransmitter, in the visual system of the cat. Anne is assisting in a number of areas of her professor's neuro-anatomical research. Part of her job is to prepare the brains for study.

"Basically what we are doing is trying to learn how one part of the brain talks to another part of the brain. It's interesting and also important. What I particularly like is the individual learning and attention. Professor Graybiel knows how I'm doing and cares. And I know almost everyone in the building."

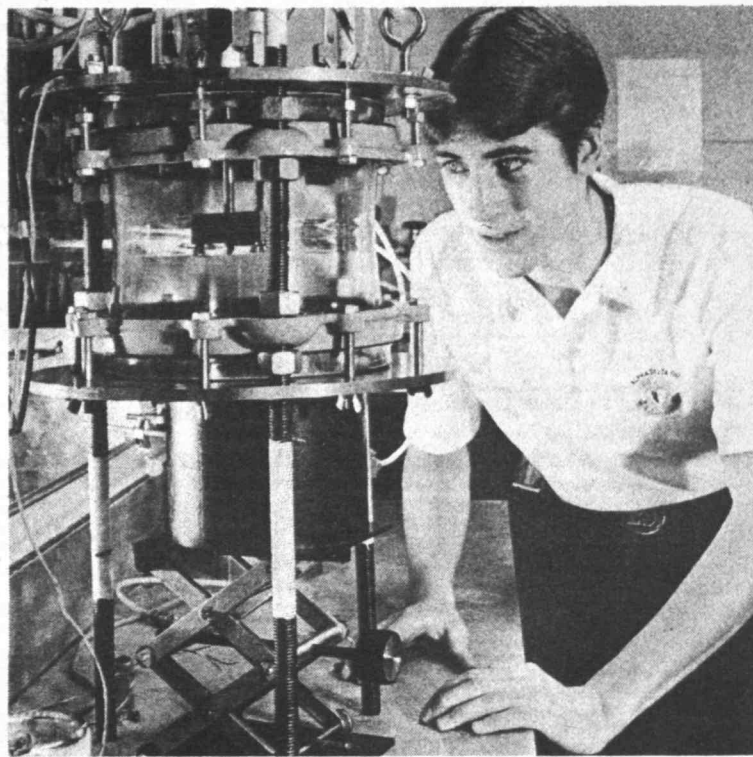
James A. Curme, from Le Sueur, Minn., used UROP as a way to learn about a particular department.

"I knew I was interested in chemical engineering," said Jim, an entering sophomore, "but without UROP I would not have felt secure enough in that interest to designate it as my major. And now I will be better able to plan my course of study because of that designation."

Jim began working in the spring term with Dr. Jack B. Howard, professor of chemical engineering, on a biomass pyrolysis program. The project is designed to determine what products remain after flash heating of cellulose material under oxygen-free conditions. This work could have applications in a fuels energy program.



Miguel Mitchell is using a capillary viscometer to measure the viscosity of a protein solution.



James Curme studies a batch reactor he helped construct for pyrolysis experiments connected with his UROP project.



Ann Serby is shown cutting a brain into very thin sections for study. Professor Margaret MacVicar, director of UROP, looks over Anne's shoulder.

"I was taking the introductory chemical engineering class," said Jim, "and attended a Course X social hour. One of the professors suggested UROP and I ended up working for Professor Howard. I didn't have a strong desire to work on any particular project, but I did want to learn about the department and what I was getting into."

"When I began, it took me a little while to learn the ropes and at first I got stuck with a lot of the chores. But as I've learned, I feel I've become very much a part of things and have been making a real contribution."

Jim constructed an instrument table and cabinet for two new and larger batch reactors for the pyrolysis experiments. He knows the setup inside out and has been working full-time this summer.

Jim plans to devote all of his time to his studies this fall and resume his research work during IAP.

"Another motivation for me to work here," said Jim, "is to get the references and experience I'll need to get other good summer jobs. During high school I worked in a cannery and did construction work. After my experience here I will better be able to convince a prospective employer of my talents and interest."

"I would say that the freshman year is the ideal time to do a UROP. Your classes are graded pass/fail and there is no better time to learn how things here work."

## Materials Processing Center Formed in Engineering

Dr. Robert C. Seamans, Jr., Dean of the School of Engineering, has announced the formation of the Materials Processing Center within the School of Engineering, and the appointment of Dr. Merton C. Flemings, Ford Professor of Engineering, as first director of the Center.

In making the announcement, Dean Seamans emphasized the growing interest and involvement of the materials community at MIT in technological problems relating to improved ways of producing and shaping materials so that they can perform more effectively for society's use—and with acceptable economic and social costs.

For thousands of years, materials processing has been practiced by skilled artisans such as those who made pottery, textiles and cast arts in Asia Minor 5,000 years ago, the beautiful and functional swords centuries ago in Japan, and who were the blacksmiths of early America. The materials processing of these workers was "materials craftsmanship," done without the basic science and understanding that characterize modern processing.

Today, we understand that advances in properties and reliability of materials depend on a combination of modern scientific understanding, and the art of the traditional craftsman. An important new concept is that performance of materials can be controlled through control of internal structure, from the macroscopic to the atomic level. Without this concept the performance and reliability we have come to expect, for example, from modern aircraft and computers, could never be achieved.

We also understand today that economic and low energy production of materials in a competitive world depends on, first, rapid assimilation of many technologies into the materials processing industry, and, second, the modification and adaptation of processes to better utilize these technologies. Such new technologies include distributed intelligence, robots, and concepts of systems engineering.

"Segments of the American materials processing industry are lagging sadly behind those of other

countries," said Professor Flemings, the Center's first director. "Innovative materials processing developments incorporating advanced technology, are essential if this country is to regain leadership in these areas."

"The Center will provide a way for the staff and faculty of the School of Engineering, and others, to contribute effectively to broad materials processing problems and to interact with industry and government in finding solutions to these problems. Through these programs and other activities, we will aim to develop and extend the broad scientific, technological, and educational base of materials processing. The Center will act cooperatively with other existing laboratories and centers at MIT working in related areas, including the Center for Materials Science and Engineering and the Laboratory for Manufacturing and Productivity."

The Center will contribute to educational goals of the Institute through development of new curricula, seminars, and continuing education programs. It will also encourage the extended residence at MIT of industry and government personnel as visiting faculty, adjunct faculty, postdoctoral researchers, etc. Faculty and staff will participate in the Center from a number of departments at MIT, principally the Departments of Materials Science and Engineering, Mechanical Engineering, Electrical Engineering, and Chemical Engineering.

Several major research programs are underway, and others are planned. Of major importance is developing new processes for producing materials for energy-efficient automobiles, for lowering the economic and social costs of primary metal production (such as magnesium and steel), and projects on computer-aided and adaptive materials processing. Basic broad science programs are also being undertaken, including study of fluid flow in processing and processing by supercooling and ultra-rapid solidification. In some cases, these programs will be carried out jointly with industry, and in all cases, with close industry and government interaction.



Alfred di Pietro of Medford and his son Stephen, who will be a graduate student at MIT this fall, don't really need a tour of the MIT campus. Mr. di Pietro, head custodian in Bldg 20, has worked at MIT for 14 years, and Stephen, who earned the BS degree in mechanical engineering from Worcester Polytechnic Institute in June 1979, worked in Bldg 44 in the summer of 1978 and in the Student Center this past summer. He will begin work toward the Engineer Degree in nuclear engineering at MIT in September.

# THE INSTITUTE CALENDAR X3-3270

August 29 through September 9

## Highlights of Residence/Orientation Week 1979

**Friday, August 31:** 8am-11pm, R/O Center open; Airport Shuttle operates, 9am-3pm; Parent's tours of the Institute leave from Lobby 7, 1pm & 4pm; Parent's Hospitality Hour, Mezzanine Lounge, Student Center, 2:30pm-4pm; Pre-Picnic Discussion Groups, Killian Court, rain location, duPont Gymnasium, 3-4pm; Freshman Picnic, Killian Court, rain location, duPont Gymnasium 4:30-6:30pm; Fraternity Rush, 6:30pm.

**Tuesday, September 4:** Freshman ID pictures taken in R/O Center 9am-5pm; R/O Center open, 9am-11pm; First set of permanent dormitory assignments available in R/O Center, 11am; meetings with Freshman advisors, 2pm; Concourse Program orientation, 3:30-4:30pm.

## Seminars and Lectures

### Wednesday, August 29

**Cascade Impactor Measurement of Sub-Micron Particles\*** — Prof. Richard C. Flagan, environmental science, California Tech. Center for Health Effects of Fossil Fuels Utilizations Seminar, 3pm, Rm 66-360.

## Community Meetings

**General Meeting and Theatre Party\*** — Sponsored by the MIT Community Players. A general meeting for all members and those interested in joining the Players, to be immediately followed by attending MTG's production of *A Funny Thing Happened on the Way to the Forum*. Fri, Sept 14, 6:30pm, West Lounge, Student Center, \$3 tickets, refreshments served. Send reservations and check for tickets to: MIT Community Players, Box 236, MIT Station, Cambridge, Mass 02139. Deadline for reservations Sept 1.

**Maggie Lettvin Self Designed Fitness\*\*** — Classes meet daily, Noon-1pm, Exercise Room or on the field.

## Social Events

**Chinese Buffet\*\*\*** — Complete with tea, pineapple and fortune cookies, \$7.75 incl tax. Wed, Sept 5, Faculty Club. For reservations call x3-4896.

**Lincoln Laboratory Authentic Food Club\*** — Our last banquet at Yenching Restaurant in Harvard Square was a great success, looking forward to our next gathering where Greek cuisine will be featured. For information call Bill Macropoulos x5476 Lincoln Laboratory.

**Faculty Club\*\*\*** — Open Monday through Friday: Luncheon served Noon-2pm; Dinner served 5:30-8pm. Happy Hour: Monday through Friday, 4:30-6:30pm, wide variety of drinks \$1.05.

## Exhibits

**Jacqueline Casey: Hayden Gallery Posters, 1966-79\*** — Sponsored by the Committee on the Visual Arts. Display examples from her fifteen years of designs for MIT exhibitions, many of which have won national awards and recognition in leading design magazines. On view daily, 10-4; Wed evenings, 6-9, through Sept 23, Hayden Corridor Gallery, 160 Memorial Drive, Camb, Mass. Information call 253-4400.

**Formal/Generative Studies Toward the New Harvard University Fogg Museum Expansion\*** — MA Thesis Drawings, Spring 1979 by Erika Franke, on view 9-5 daily, through Sept 13, Rotch Visual Collections, Rm 7-304.

**List and Stratton Student Loan Collections\*\*** — Sponsored by the Committee on the Visual Arts. On view daily, 10-4pm; Wed evenings, 6-9pm, Sept 4-14, Hayden Gallery. Information call 253-4400.

**Gjon Mili\*** — Sponsored by the Compton Gallery Committee. A '27 graduate of MIT, he is a noted photographer whose work for Time-LIFE Magazine; his pioneer use of strobe lighting; and his documentation of MIT will be exhibited. On view daily, Mon-Fri, 10am-5pm; weekends, 1-5pm, Sept 4-Jan 1980, Margaret Hutchinson Compton Gallery, Alumni Center, Rm 10-150. Information call 253-5014.

**MIT Historical Collections\*** — Vannevar Bush, '16, Bldg 4 corridor. The New Technology Exhibit, 2nd floor balcony of Lobby 7. Energy Exhibit, Bldg E40, 1st floor. Solar Energy, Bldg 8, main corridor. Harvard-MIT Rehabilitation Engineering Center, main corridor, Bldg 4. Rogers Building Exhibit, Bldg 4. Meteorology, corridor, Bldg 8. Norbert Wiener, and Karl Taylor Compton, Bldg 4. Laboratory for Physical Chemistry, Bldg 6.

**MIT Historical Collections\*** — In-house exhibits include antique globes; the Ellsworth A. Wentz Collection of motors and meters; rare instruments including compasses, sundials and other measuring devices from the 17th and 18th centuries; Early Alumni and several exhibits of memorabilia and photographs honoring prominent graduates of the Institute; The Compton Years, a photographic essay of the lives of Dr. & Mrs. Karl Taylor Compton. Recently installed exhibits: "Hello Central", traces the development of the telephone as well as the relationship between Alexander Graham Bell and MIT; "X-Ray Astronomy Sounding Rocket"; "L'ere de Despradelle", architectural renderings from the Beaux Art period of 1893-1912 as influenced by Prof Constant Desire Despradelle. On view daily, 9am-5pm, 265 Mass Ave, 2nd floor, Camb, Mass.

**New Records\*** — Music Library, Rm 14E-109. Exhibit of record jackets of recent Library purchases.

**The Outdoor Collection\*** — There are many fine pieces of contemporary sculpture displayed on the MIT campus, including works by Alexander Calder, Louise Nevelson, Pablo Picasso, Henry Moore, Tony Smith and Jacques Lipschitz. For information and guides to the campus, call the Information Center, x3-4795.

**Strobe Alley\*** — High speed photographs by Harold E. Edgerton, Institute Professor and Professor of Electrical Measurement, Emeritus. Bldg 4, 4th floor.

**MIT Science Fiction Society\*** — Come and visit the world's largest lending science fiction library. Hours posted on door, Rm W20-421.

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

## Theater

**A Funny Thing Happened on the Way to the Forum\*** — Presented by the Musical Theatre Guild. Fridays & Saturdays, Aug 31 through Sept 15, 8pm; Sun matinee, Sept 9, 3pm, Kresge Auditorium, Little Theatre, Tickets \$4, group rates available, \$2 w/MIT ID, available in Lobby 10 or at the door. Information and reservations call 253-6294.

**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 Sept. 5 through Sept. 16 to Calendar Editor, Rm 5-113, x3-3270, before Noon, Friday, Aug. 31.

## Theodore A. Mangelsdorf

Funeral services for Theodore A. Mangelsdorf, retired executive vice president of Texaco Inc., and a former member of the Corporation and benefactor of MIT, were held Tuesday, Aug. 28, at St. Peter's Episcopal Church, New Kent, Va. Mr. Mangelsdorf, 76, died Thursday, Aug. 23, after a brief illness.

Mr. Mangelsdorf was a 1926 graduate of MIT with the SB degree in chemical engineering, and the SM degree in 1929. He was associated with Texaco Inc. throughout his career.

Mr. Mangelsdorf was an active alumnus and was cited as the principal architect in the establishment of the New York Alumni Center. He served as president of the Alumni Association in 1966-67.

He was a member of the MIT Corporation from 1962-67 and of the Corporation Executive Committee from 1964-66. During his term on the Corporation he served on visiting committees for several

departments including chemistry, chemical engineering, mathematics, and economics, and on the Corporation Development Committee.

In 1962 the Brookdale Foundation, a private foundation established in New York City by a friend of Mr. Mangelsdorf, honored him by establishing the Theodore A. Mangelsdorf Fund at MIT to endow scholarships for undergraduate students.

Mr. Mangelsdorf is survived by two sons who are also MIT alumni, Theodore A. Mangelsdorf, Jr., '51, and Frederick E. Mangelsdorf, SM '60.

## WMBR to Air R/O Highlights

MIT's community radio station, WMBR (88.1 MHz) will add the morning hours of 7am-noon to its usual broadcast day of noon-3am during R/O week.

Plans for R/O week include remote broadcast from the activities midway on Thursday, Sept. 6, from Briggs Field on Saturday, Sept. 8, and from duPont Gymnasium on registration day. Interviews with freshmen, live and on tape will be featured throughout the week's programming of news and music.

Representatives of different student activities will also be given air time throughout the week to tell listeners about their clubs and groups. To get on the air, call Bob Brosseau, director of activities at x3-4000.

The station is going from 20 to 200 watts this year, and students who want to be involved will find it an exciting time to be a part of its operation. People are needed in all phases of the station's operation, from announcing to management and technical work. WMBR is located in the basement of the Walker Memorial, Rm. 50-030. Anyone interested in working for the station is welcome to visit the facility and talk with the staff.

## Geschwind Article

Dr. Norman Geschwind, professor of psychology at MIT and professor of neurology at Harvard Medical School, is author of an article, "Specializations of the Human Brain," in the September, 1979, issue of Scientific American,



**MANY HANDS** made light work of assembling the new MIT Personnel Policy Manual last week in Office of Personnel Development (OPD) conference room. One group of assemblers was (from left): Gail Cowgill, a temporary employee; Adam Yagodka, co-director of OPD; Paul Church, secretary in OPD; Susan Lester, personnel officer who edited the Manual, and James Culliton, assistant to the vice president for administration and personnel. Altogether 17 people were involved in the two-day assembly of the books, which are now appearing in offices and laboratories throughout the campus.

## Ready or Not, Here Comes '83

(Continued from page 1)  
less time and cause less confusion and delay.

The second is a streamlining of the orientation program. Traditionally, a great deal of time has been given to a formal presentation of options for core courses, material that freshmen have already read in the freshman handbook, mailed to them in the summer. Many have skipped this part of the program, relying on the academic midway for specific information that they need.

This year, the program will be modelled on last year's Trailblazing seminar. Brief formal presentations will be made by MIT Provost Walter A. Rosenblith, followed by Dean Robert A. Alberty of the School of Science and Dean Harold J. Hanham of the School of Humanities and Social Sciences. After further five-minute discussions of the core subject options, the full group will break up into small groups for specific questions in the areas of biology and chemistry, mathematics, physics, humanities and social sciences, and the general education program. The R/O committee hopes that this will enable the academic

midway to fill its designed function of informing freshmen of their options in elective courses.

The midways, academic, activities and athletic, bring the atmosphere of a fair to the orientation period. On Thursday, Sept. 6, the activities midway will be set up in duPont Gymnasium, introducing freshmen to the myriad of extracurricular activities at MIT. Model railroad buffs, frisbee, chess and tiddleywinks players will all find

friends in the general activities area. Campus media—newspapers, radio and TV stations—musical and theatre groups, special interest and service groups, and campus religious groups will all be represented.

At the same time, the Athletics midway will be under way in Rockwell Cage, introducing freshmen to the intramural and varsity sports which will be part of their lives at MIT.

## International Open House Planned

The seventh annual International Open House to greet newcomers from abroad is scheduled for Tuesday, Wednesday, and Thursday, September 4-6, from 9:30am to 5:00pm in the Bush Room (10-105).

All new internationals—undergraduates, graduate and postdoctoral students, visiting scientists, faculty, and their families—are invited to meet members of the MIT community and learn about campus programs and community resources that will make their stay easier. Representatives from a wide range of campus services and organizations will be on hand to talk informally with the new-

comers and share refreshments with them. A special children's corner will help keep youngsters happy.

A highlight of the Open House will be the program, "An Evening with MIT Faculty" on Tuesday, September 4, 7:30-9:30pm. Dr. Louis Menand, special assistant to the provost and senior lecturer in political science, will chair the panel composed of Professors Margaret L.A. MacVicar of Physics; Philip Morrison of physics; Michael J. Piore of economics; and William M. Siebert of electrical engineering and computer science, who will talk about living and working at MIT.

## Mary E. Finn

Mary E. Kelley Finn, a telephone operator at MIT from 1952 until her retirement in 1967, died Wednesday, August 15, at the age of 79.

Mrs. Finn, who lived in Roslindale, is survived by three sons, Benjamin F. Finn of Chelsea, James M. Finn and Joseph P. Finn, and a daughter, Mrs. Majorie T. Gill, all of Roslindale, and 25 grandchildren.

## Walter Parkinson

Walter Parkinson, a security guard at the Draper Laboratory from 1956 until his retirement in 1975, died July 12. He was 68 years old.

Mr. Parkinson is survived by a daughter, Joan Mooney of Scottsdale, Arizona.

## John B. Nyren

Word has been received that John B. Nyren, of New Brunswick, a painter at the Physical Plant from 1943 until his retirement in 1963, died July 15. He was 79 years old.







# Chrysalis Takes To Air Via Human Power

(Continued from page 1)  
num tube and piano wire primary structure instead of the more advanced carbon fiber filament tube and piano wire primary structure of the *Albatross*. Both airplanes make extensive use of styrofoam, Kevlar and Mylar in their secondary structures. It says a great deal for the aerodynamic refinement of the *Chrysalis* that its performance is so good con-

sidering its size and weight handicap.

The students primarily involved in the design and construction of *Chrysalis* are Hyong Bang of Smyrna, Ga., Mark Drela of Philadelphia, Pa., John S. Langford, III, of Atlanta, Ga., Robert W. Parks of Boston and Harold Youngren of Annapolis, Md. Professor Larrabee served as a consultant and fabricator of a few non-

critical parts. Karen Dillon of Camden, N.Y., Eric Shain of Fairbanks, Alaska, Fred Shecter of East Meadow, N.Y., and about a dozen other friends helped with the nearly endless detail of the construction. Without the cooperation of Lincoln Laboratory, which provided hangar space, and Hanscom Field ground operation, the whole project would have been impossible.

Bryan Allen is the 20th person to fly *Chrysalis*. Karen Dillon is one of the women who have made *Chrysalis* a human-powered rather than a man-powered airplane.

The longest flights to date have been about three minutes; a steady turn of more than 90° has been maintained; an altitude of more than 20 feet attained. Since there are no prizes

for *Chrysalis* to win, its flights have been for fun. Three professors, Eugene E. Covert, Walter M. Hollister and Jack L. Kerrebrock, have even flown it.

*Chrysalis* is an aeronautical *objet d'art*. Its aesthetic character impresses all who see it, particularly in flight. It has lightened the life of everyone associated with it.

## MIT Team Identifies First Double Quasar

(Continued from page 1)  
radio astronomers in other observations.

To test the gravitational lens hypothesis, the MIT scientists made a set of observations with the Very Large Array (VLA) of the National Radio Astronomy Observatory (NRAO) near Socorro, NM.

Their radio map shows two point-like images in the same places on the sky as the optical images, and in addition a powerful, extended radio source apparently associated with one of the point images. Although these findings do not completely rule out the hypothesis of a gravitational lens, they said, "our favorite interpretation is that it is the first example of a true double quasar."

Results of their observations, they said, "are consistent with the source being a true double object, with the north component actively ejecting relativistic plasma" in a jet similar to those of better known quasars.

The new radio study of the unusual object was reported in a paper scheduled to be published in the August 31, 1979, issue of *Science* magazine by Dr. David H. Roberts, research staff member in the MIT Research Laboratory of Electronics, Perry E. Greenfield, an MIT graduate student in physics, and Dr. Bernard F. Burke, MIT professor of physics. The observations with the NRAO facility were made by Dr. Roberts and Mr. Greenfield. The research was supported by a grant from the National Science Foundation (NSF). The NRAO is operated by Associated Universities, Inc., under contract with the NSF.

Optical studies of 0957+561 A and B, which are about 10 billion

light years away, were made in late March, 1979, by Dr. Dennis Walsh and Dr. Robert F. Carswell, two English astronomers, and Professor Ray J. Weymann, of the University of Arizona, using the 2.1-meter telescope of the Kitt Peak National Observatory. In the British journal *Nature* they reported that the objects' spectra "leave little doubt that they are associated" but they cited difficulties in describing them as two distinct objects and suggested "the possibility that they are two images of the same object formed by a gravitational lens."

Intrigued by this report and the fact that "little was known about the radio structure of the source," the MIT group used the 14 available antennas of the VLA to make a radio "picture" of the same quasars in late June, 1979.

"The near identity of the radio and optical spectra of the compact objects is still remarkable," the MIT astrophysicists said in their report. They added: "We suggest that the two objects had a common origin, are similar in their basic physical parameters, and that they are evolving in similar fashions." Both radio and optical properties of the objects "are thus characteristic of this stage in their evolution," they said.

The MIT astronomers also calculated that if 0957+561 A and B are indeed a gravitational lens double image, the effect is most likely caused by an object 100 times as massive as any galaxy yet observed. "No such massive objects are known," they said, "so if the gravitational lens hypothesis is correct, a dramatic new class of objects would be required" in the universe.

## Engineers Take the Field For Fall Football Practice

First-year coach Dwight Smith greeted approximately 60 players Monday (Aug. 27) when MIT began preparations for its second season of club football competition. The Engineers were 0-6 last year in their first campaign of organized football since 1902.

"We'll be a vastly improved team because there's more interest this year and more kids are coming out for the team," says Smith.

MIT returns its starting offensive backfield—quarterback Bruce Wrobel (6-2, 205) of Evergreen Park, Ill., halfback Jeff Olson (5-10, 160) of Edina, Minn., and fullback Roger Sacilotto (5-10, 180) of Manville, R.I.—from a unit which averaged 14 points a game in 1978.

Returning linemen include end Greg Henley (6-0, 180) of Hollis, N.Y., guard Tom Fawcett (5-11, 200) of Wrightsville Beach, N.C.,

center Dave Noble (5-11, 180) of Holdrege, Neb., Walt Crosby (6-0, 220) of Lakeville, and Bob Napor (5-10, 185) of Glen Ridge, N.J.

Crosby started at center last year, but is being moved to tackle. Napor, a starter at defensive tackle last season, is being switched to the offensive line.

Among the returning defensive players are linebacker Keith Therrien (5-10, 180) of Lynn, end Art Aaron (5-11, 185) of Poland, Ohio, safety Brad Pines (5-10, 165) of Traverse City, Mich., and cornerback Mike Barrett (6-0, 170) of North Tarrytown, N.Y.

"Offensively, we have the ability to move the ball and score points," notes Smith. "The offensive line is pretty weak right now but we should have a solid backfield. Defensively, there'll be a lot of new faces."

The 27-year-old Smith, an assistant last year, moves to the head coaching position replacing Ted



School ties may be the custom in the East, but in California T-shirts are the symbol of academic affiliation, says Dennis Robinson, a graduate student at the University of California at Los Angeles. Appropriately, he presented commemorative shirts to two senior MIT academic officers at the close of MIT's pioneering summer program on Principles of Toxicology. Accepting the shirts were Dr. Walter A. Rosenblith, MIT provost, and Dean Robert A. Alberty of the School of Science, who chaired the committee

that planned the program. Believed to be the first of its kind anywhere, the 10-week graduate credit program was sponsored in part by the US Environmental Protection Agency (EPA). Forty-seven persons from throughout the country were enrolled in the program which was conducted by the MIT Department of Nutrition and Food Science. Dr. Rosenblith presented certificates to Mr. Robinson and other program members at the last session on Thursday, Aug. 23, 1979. —Photo by Calvin Campbell

## Photovoltaic Radio Station Airs in Ohio

(Continued from page 1)  
tinuing program to bring solar cells into widespread use by the mid 1980s. With a broadcasting application of the experimental PV system, another step has been taken in exploring commercially feasible uses for a promising energy alternative.

The project is being jointly undertaken by Lincoln Laboratory and WBNO, with the radio station furnishing the building and site, the transmitter load, and the interface equipment. Committed to informing the general public as well as experts about the experiment, Luke Thaman, general manager of WBNO, expects to welcome many visitors to the station. In addition, WBNO will monitor the system, relaying data to Lincoln Laboratory so that performance can be evaluated over a period of several years.

Because a solar array's output is not constant, a battery is used to store excess energy when array output exceeds the demands of the transmitter; the battery saves the energy for use by the transmitter when the array output is low. According to Burt Nichols, Lincoln Laboratory's engineer in charge of the project, the PV system will supply from 70 to 90 per cent of the total energy required by the AM transmitter on an annual basis, with the remainder supplied by the

Rose. Assisting Smith this year will be Gordon Kelly, Mark Shapiro, and Charlie Sardo.

MIT opens its season at home at 1:30pm Saturday, Sept. 22, against Norwalk Community College at Steinbrenner Stadium.

Other games on the schedule are: September 29, at Roger Williams; October 6, at Fairfield; October 13, New York Maritime (Homecoming); October 20, Fitchburg State; October 27, at Siena; November 3, Stony Brook State.

local utility. The system will only draw on the utility when the sun is hidden by clouds and the state-of-charge of the battery is low.

Surplus energy will be available from the array, however, on clear, bright days when the battery is at full charge. Then the control system will automatically connect additional studio, newsroom or production room loads to the system. If excess array power is still available, says Mr. Nichols, the control system will then disconnect portions of the array output.

"Extensive commercial use of PV power in the field of communications can be foreseen," says Marvin D. Pope, manager of the Lincoln Laboratory Photovoltaic Project, "with power provided by this means to many AM, FM and TV stations."

He explained that a daytime radio station provides an excellent application of the experimental system, with constant, predictable direct current loads and daytime operational hours. Also a plus is the space necessary to accommodate the array—in WBNO's case, one-third of an acre—which is available at any station where ground-based guy wires anchor an antenna.

Mr. Pope said that although the cost of solar-generated electricity is presently greater than that from conventional utility sources, the gap is rapidly narrowing as a result of decreasing costs for solar cells and rising costs for conven-

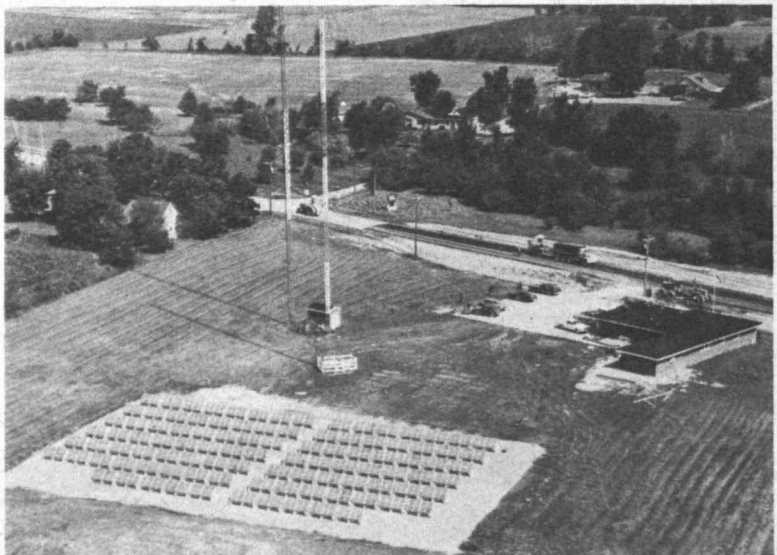
tional energy. Cost, however, is not uppermost in the minds of Luke Thaman and Bill Priest, who is program director at the station. They and other staff are enjoying WBNO's experience of being first with an exciting and hopeful technology.

### Other PV Projects

In addition to Station WBNO, Lincoln Laboratory field test projects include: a 25 kW peak power system at the University of Nebraska's Mead Experiment Station used for irrigation, crop drying, and fertilizer manufacturing; a 12 kW peak array at the Laboratory used to pretest potential components of PV power systems for field test applications; a 25 kW peak array at the Laboratory used for testing complete systems; ongoing development of a small, cost-competitive "micro-pumping" system consuming less than 1 kW peak; several small (100 watt peak) arrays located in various urban and rural sites.

Scheduled to begin operations in 1980 is a 100-kilowatt PV system planned for Natural Bridges National Monument in Utah, which will produce all of the power needed by the park and will relegate the park's existing diesel generators to backup service. It will be the most powerful installation of its kind in the world.

Finally, a major project dealing with development of PV systems for residential use is now being started at Lincoln Laboratory.



Aerial view of AM radio station WBNO, Bryan, Ohio. Sponsored by the US Department of Energy and developed jointly by MIT Lincoln Laboratory and WBNO, the station's AM transmitter is powered by a solar array covering one-third acre of land. The array contains 33,600 photovoltaic cells and can generate 15,000 watts of electricity from sunlight.

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