CALTECH NEWS

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PUBLISHED FOR ALUMNI AND FRIENDS OF THE CALIFORNIA INSTITUTE OF TECHNOLOGY

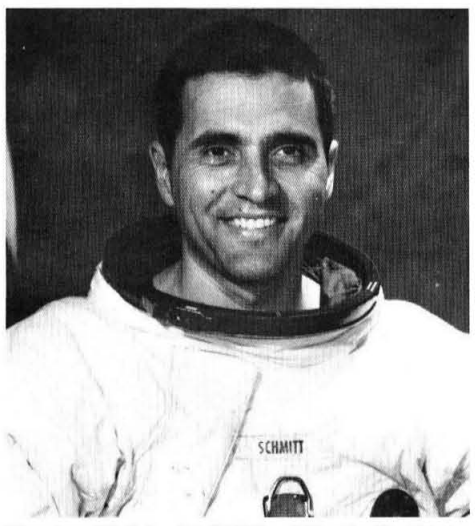
Fairchild Scholars grant announced

Leaders in science, industry, government, the social sciences and the humanities will come to Caltech as distinguished visitors in a new program financed by a $7.5 million grant from the Fairchild Foundation.

The program will be named the Sherman Fairchild Distinguished Scholars Program in honor of the late Sherman Mills Fairchild—inventor, manufacturer, business executive, and financier. Fairchild was a pioneer in aerial photography, aerodynamics, aircraft engine design, photography and photographic equipment, as well as audio engineering, optics, flight instrumentation, and sound reproduction.

Beginning in July 1973, the new program will enable men or women of recognized achievement or young people with outstanding potential to come to the Caltech campus to share their knowledge.

Twelve exceptional men have already accepted invitations to participate in the program. The first Fairchild Scholar to arrive on campus will be Caltech alumnus Harrison H. Schmitt, BS '57, the first scientist to explore the moon. Another alumnus who will be visiting under this program is geophysicist and oceanographer Walter H. Munk, BS '39, MS '40, associate director of Scripps Institution of Oceanography, La Jolla, Calif.



Harrison H. Schmitt, BS'57, will be the first Fairchild Scholar to come to the Caltech campus.

Other Fairchild Scholars who will come to Caltech in the next two or three years are: Sir George Porter, Nobel Laureate, director, and Fullerian Professor of Chemistry, the Royal Institution, London; physicist Robert Dicke of Princeton University; chemist Eugene van Tamelen of Stanford; chemical engineer Harry G. Drickamer of the University of Illinois; astronomer Sir Fred Hoyle of the University of Manchester, England; geophysicist Francis Birch of Harvard; and Milton Katz, director of international legal studies at Harvard Law School.

Dr. Howard W. Emmons, Gordon McKay Professor of Mechanical Engineering at Harvard; S. J. Singer, professor of biology, University of California at San Diego; and J. Tuzo Wilson, physicist and president of the Erindale College campus of the University of Toronto, Canada.

The Fairchild Foundation will finance the program for ten years at $750,000 a year. At the end of that time, the program may be continued, subject to agreement between the foundation and Caltech.

At a press conference announcing the program, President Harold Brown called it "the outstanding, university-connected, distinguished-visitor program in the world."

Approximately 20 distinguished scholars will be on campus at any one time —their appointments ranging from a minimum of three months to a maximum of two years.

Although Fairchild Scholars may engage in teaching, research, lecturing, individual study, or a combination of all of these things, their most important function will be to meet faculty members and students in all the academic divisions.

"Although the scholars may represent many fields, all those accepted must exhibit an interest in science and technology and in applying knowledge from these fields to meeting human needs," Brown said.

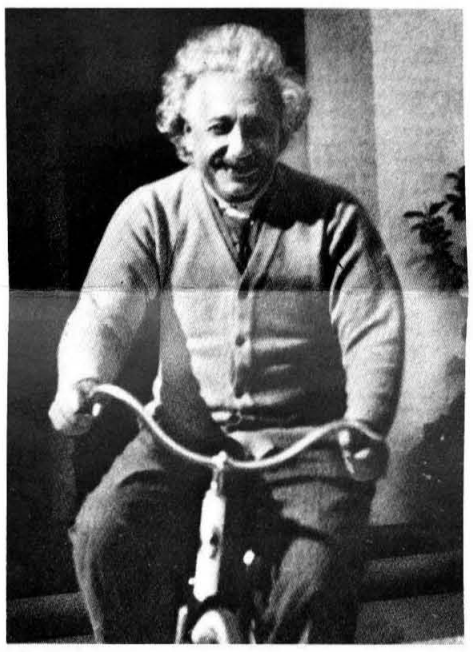
The Fairchild Distinguished Scholars Program continues Caltech's tradition as an intellectual center that attracts the leading minds of the world.

As early as the 1920's, Caltech's visitors included such distinguished men as Dr. H. A. Lorentz, the outstanding Dutch physicist and Nobel Laureate; Dr. George H. Darwin, son of the famed evolutionist and a distinguished scientist in his own right; Dr. Arnold Sommerfeld, the prominent German physicist; and such leading European pioneers of aviation as Walter Tollmein and Reinhold Seiferth.

Another visitor who came—and later returned to head Caltech's Guggenheim Aeronautical Laboratory—was Theodore von Karman, often called the father of modern aviation. As a result of von Karman's leadership, southern California became a world leader in aeronautics research and development.

In 1931-32, the century's most celebrated scientist, Albert Einstein, spent several months on the Caltech campus.

Later decades brought visits from such leaders of industry as Donald Douglas of Douglas Aircraft; the Gross Brothers of Lockheed; John Northrop of Northrop Aircraft Inc.; and such eminent scientists as physicist Niels Bohr, physicist Enrico Fermi, and India's distinguished aeronautical engineer, Dr. Satish Dhawan.



The Fairchild program carries on a tradition of visits by great men that included Albert Einstein.

Astronomer Sir Fred Hoyle (left), who met with Caltech's Nobel laureate Richard Feynman in England last year, has accepted an invitation to visit Caltech as a Fairchild Scholar.

Standard Oil Company raises its level of support to Caltech

The first corporation to join Caltech's Industrial Associates, Standard Oil Company of California, will reach a new level of support for the Institute in 1972-73 with gifts totaling $71,300, according to W. H. Corcoran, vice president for institute relations.

Standard Oil's projected gifts for 1972-73 are earmarked primarily for general operating expenses and student aid, in addition to a $20,000 Industrial Associates membership and $10,000 to support research in chemical engineering, chemistry, and seismology.

Corcoran noted that Standard Oil has raised its level of support for the Institute by 43 percent over the last two years, increasing its total gifts from $39,800 in 1970-71 to $67,300 in 1971-72 to a total of $71,300 pledged for 1972-73.

In commenting on the importance of this annual-giving program Corcoran said, "Standard Oil's gifts are especially welcomed because a substantial part of them fall within areas where the Institute's needs are most pressing—particularly unrestricted money for general operating expenses and student aid."

Noting that $15,000 of the company's total gifts this year are for general operating expenses Corcoran said, "The Institute places a high value on such gifts because general operating funds provide the foundation that makes all of Caltech's other programs a reality.

"Tuition accounts for only 10 percent of our total budget. The Institute is always vulnerable to fluctuations in the remaining sources. General operating funds give us the flexibility and stability to plan ahead and meet important needs not covered by gifts earmarked for a specific purpose."

Alluding to the $8,350 Caltech is receiving from Standard Oil for student aid Corcoran commented, "This money is vital because funds for student support from the federal government — particularly support at the graduate level — have been sharply curtailed. By the next academic year we will have lost a total of 200 graduate fellowships from federal agencies since 1967-68, the year fellowship aid was at its peak.

"The actual costs of an undergraduate education are at least three times the $2,760 tuition charge, and at least six times the same tuition charge for a graduate student. Moreover, two-thirds of Caltech's undergraduates receive some scholarship assistance, and graduate students generally get full tuition support as well as stipends for living expenses. Private gifts—such as those from Standard Oil—have to be obtained to offset the reduction in student aid from Federal sources."

The company has provided financial support to Caltech's Industrial Relations Center since its inception in 1939.

The first company to join the Industrial Associates, Standard Oil Company of California has been an active member since the organization was formed in 1949 as a means for the Institute to share its expertise with research-oriented industries.

The membership has fostered a broad, long-lasting interchange between the two institutions. At present 93 alumni of Caltech are employees of Standard Oil Company of California and its subsidiaries. Several Caltech faculty members have served as consultants. Top representatives of the oil company and its subsidiaries have taken an active interest in the Institute.

Howard G. Vesper, a former director of Standard Oil Company of California, is a member of Caltech's Board of Trustees, and Dr. N. A. Riley, president of the Chevron Oil Field Research Company, recently accepted an appointment to the Visiting Committee of the Division of Geological and Planetary Sciences, composed of government, business, and academic leaders from outside the Institute who advise the division concerning education and research.

The company participates in Industrial Associates seminars designed to make member companies aware of the newest developments in science and engineering and to provide personal contacts between Caltech faculty and personnel of member firms. It receives news of current research at the Institute of interest to industry through selections from the more than 1,000 annual publications of Caltech faculty available to Industrial Associates members.

Alumnus supports recycling center

William A. Minkler, BS '27, now retired and living in Pasadena, has been helping Caltech students reactivate a recycling center on campus.

Although he has no illusions that the project will make a big impact on the problems of trash pollution and energy conservation, Minkler is convinced that the student-operated center can be an important way to dramatize the need to recycle.

"If people see students giving up their study and recreational time for such a difficult, unglamorous job," he says, "then I hope they will at least take the time to bring their own reusable material."

Minkler, who feels that recycling eventually must become a consistent practice in our society, discovered the student project while looking for a local recycling center. Since then, he has helped the students sort trash on work days and given them advice on operating the project.

Minkler believes it is essential to create a keener public awareness of the problems created by nondisposable trash—and the importance of conserving energy through reprocessing.

"If you reuse paper you cut down fewer trees, and you also save the energy that would have been used in cutting them. That's important in view of today's energy crisis," he says.

"There are about 700 Caltech alumni in Pasadena. If all of them would support these students by bringing in their own material, they could do a great deal to make the center a success—and thus contribute to a greater awareness of the need."

The recycling center, located in a neat white shed on the parking lot behind Steele Laboratory, was formed by the Caltech Environmental Action Council—about 20 students, most of whom are undergraduates. Brian Yandell, a junior majoring in mathematics, is president of the organization and Dikran Antreasyan, a senior majoring in physics, is secretary-treasurer. The area is screened from public view by a semi-opaque green barrier.

The students have sent a call into the community and on campus for glass, aluminum, random metal (a polite name for tin cans), newspapers, computer paper, and computer cards. The material is sold for recycling, and the proceeds go to pay for such expenses as rental of the truck that hauls the material away.

Collection boxes have been set up in student houses, and the Booth Computing Center has agreed to contribute its used paper. Substantial contributions have come from the community, mainly glass and aluminum.

William Minkler, BS '27, (third from right) works at the recycling center with members of the Caltech Environmental Action Council including (from left, back row) Jim Look, Dikran Antreasyan, contractor Bill Eddie, Dave Larwood and (front row) Bryan Yandall and Jim Leger.

Ira Bowen dies of heart attack

Ira Sprague Bowen, PhD '26, longtime Caltech faculty member and director of the Hale Observatories for 16 years, died February 6, following a heart attack. He is survived by his wife, Mary.

Born in Seneca Falls, New York, in 1898, Bowen joined the faculty in 1921 as an instructor of physics. He became a full professor in 1931, was named director of the Mt. Wilson Observatory in 1946, and director of the combined operation at Palomar and Mt. Wilson Observatories in 1948.

Since retiring as director of the two observatories in 1964, Bowen had been active as a Distinguished Service Member of the Hale Observatories. In this capacity, he worked on problems involving the design and improvement of the telescopes at the observatories and consulted on their planning and performance.

He is credited with important contributions to the performance of the world's greatest telescope, the 200-inch Hale instrument atop Palomar Mountain, with which astronomers have made great advances in their understanding of dimensions and geometry of the universe.

Beginning in the early 1930's, Bowen was associated with the planning of the Palomar project and was responsible for the final testing and completion of the 200-inch mirror. He devised and personally supervised ingenious optical tests to determine the corrections to be made in the mirror after it was mounted on the telescope.

He was a consultant in the design of several other telescopes, including the 120-inch instrument at the Lick Observatory of the University of California and the 84-inch optical telescope and the solar telescope at Kitt Peak National Observatory in Arizona.

In addition, he developed improvements for spectrographs and cameras used in astronomical work and devised instruments, such as the image slicer, to increase the efficiency of spectrographic observations.

Earlier in his career, as a physicist, Dr. Bowen solved the baffling mystery of the so-called "nebulium" spectral lines. These lines, observed in the spectra of gaseous nebulae in interstellar space, could not be detected in the laboratory. They were believed to result from a gas, called nebulium, that was nonexistent on earth.

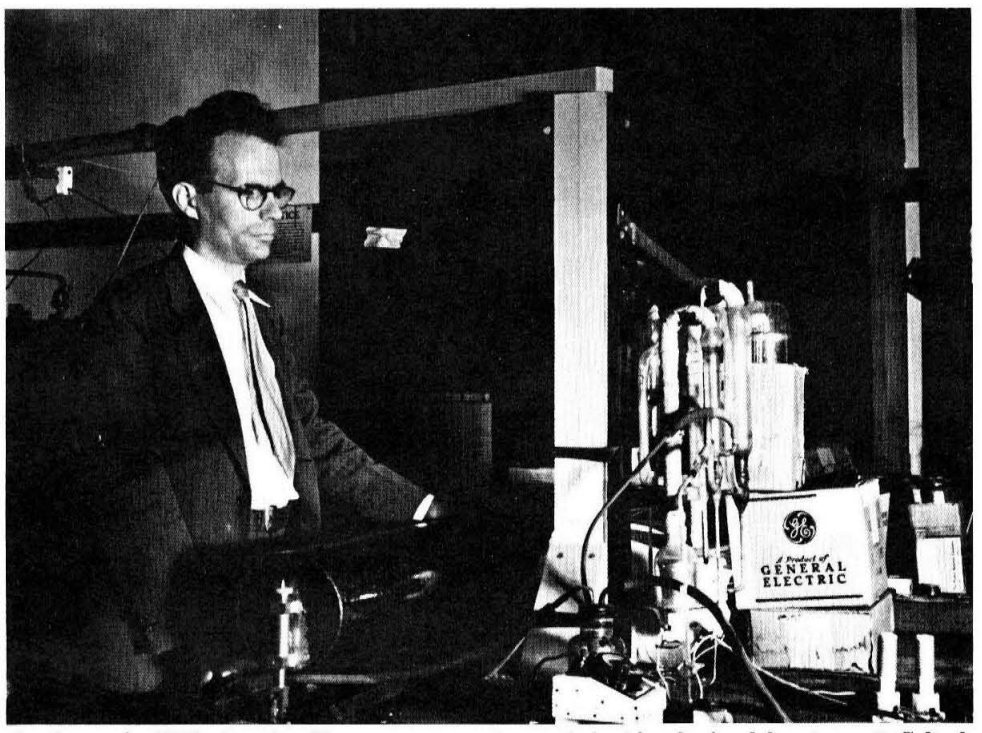
Bowen discovered that this interpretation was not correct. Spectral lines supposedly result from electrons jumping from one energy level to another. In space, gas atoms can be so spread apart that they collide only infrequently. The scientist discovered that electrons thus have sufficient time to make certain long-wait jumps which they could not have made on earth, thus creating the mysterious lines. He predicted and identified many of these "nebulium lines" in common chemical elements. Bowen also devised vacuum spectrographs so that he could determine these spectra in greater detail.

He published numerous papers on spectroscopy, the composition of gaseous nebulae, cosmic rays, optics, and the design and construction of large telescopes. For many years he taught optics and spectroscopy at Caltech.

During World War II, Bowen made contributions to the improvement of trajectories of underwater missiles and to wartime photography. He supervised the photographic section of Caltech's rocket project for the Office of Scientific Research and Development.

He received many honors for his scientific work. In 1935, he was elected to the National Academy of Sciences. He was awarded the Henry Draper Medal of the National Academy of Sciences in 1943, the Potts Medal of the Franklin Institute in 1946, the Count Rumford Medal of the American Academy of Arts and Sciences in 1949, the Ives Medal of the Optical Society of America in 1952, the Bruce Medal of the Astronomical Society of the Pacific in 1957, and the Gold Medal of the Royal Astronomical Society in 1966. He was a member of the American Philosophical Society and of the American Academy of Arts and Sciences.

He received honorary degrees from his alma mater, Oberlin College; from the University of Lund in Sweden; and from Princeton University.



Ira Bowen in 1935 at work with a vacuum spectrograph in his physics laboratory at Caltech.

Vietnam device gives Palomar clearer image

Distant objects in the universe are being brought into clearer view at the Palomar Observatory by means of a device originally developed to detect enemy troops in Vietnam.

It is a low-light, image-intensification tube that needs hardly any illumination to detect anything within its view. Caltech's version is attached to the eyepiece of Palomar's 200-inch telescope where it electronically amplifies by 2,000 times or more the faint light coming from extremely remote objects. The light is then transmitted to a television-camera tube and displayed on a TV monitor.

Astronomers say that the tube enables them to center on very faint objects faster, so that more time can be spent in observing them rather than searching for them. Without the intensifier system, an observer has to sight very carefully on a distant object, take at least a 15-minute exposure of it, and then wait days for the photographic plates to develop. Even then there is a posibility that the telescope is not trained squarely on the faint object. If this happens, the astronomer may have to wait for weeks for another turn at the telescope.

With the advent of the tube, the exposure time for a faint object is cut to around 10 seconds, and the processing time reduced to a 30th of a second.

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EDITORIAL STAFF

Executive editor: William K. Cassell

Associate editors: Joy Hays, Winifred Kennedy, Janet Lansburgh, Kathleen Marcum, and Kay Walker.

Alumni Board nominates directors

The Board of Directors of the Alumni Association met as a nominating committee on January 23, 1973, in accordance with Section 5.01 of the bylaws. Six vacancies on the board, in addition to the positions of president, vice president, secretary, and treasurer, are to be filled. The present members of the board, with the years in which their terms expire are:

Charles E. Auerbach, MS'47, ChE'48—1973
Stuart M. Butler, BS'48—1974
William J. Carroll, BS'48, MS'49—1975
Spicer V. Conant, BS'64—1974
Raymond L. Heacock, BS'52, MS'53—1973
James L. Higgins, BS'56—1975
William C. House, BS'40—1973
P. Douglas Josephson, BS'65—1974
Richard A. Karp, BS'64—1973
Wayne T. McMurray, BS'45—1974
Reuben B. Moulton, BS'57—1973
Richard C. Nielsen, BS'66, MS'67, PhD'71—1975
Hubert M. O'Haver, BS'29—1973
Cornelius J. Pings, BS'51, MS'52, PhD'55—1973
Arthur O. Spaulding, BS'49, MS'58—1974
Fred A. Wheeler, BS'29—1975
Stanley T. Wolfberg, BS'38—1974

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The following individuals have been nominated for the terms beginning at the close of the annual meeting in June 1973:

President—Stuart M. Butler, BS'48, 1 year
Vice President—Raymond L. Heacock, BS'52, MS'53, 1 year
Secretary—Stanley T. Wolfberg, BS'38, 1 year
Treasurer—Fred A. Wheeler, BS'29, 1 year
Director—Rea A. Axline, BS'31, 1 year
Director—G. Louis Fletcher, BS'56, MS'57, 3 years
Director—John D. Gee, BS'53, 3 years
Director—Robert B. Grossman, BS'33, 3 years
Director—Richard A. Karp, BS'64, 3 years
Director—Leon T. Silver, PhD'55, 3 years

Section 5.01 of the bylaws provides that the membership may make additional nominations for directors or officers by petition signed by at least fifty regular members in good standing, provided that the petition is received by the secretary not later than April 15. In accordance with Section 5.02 of the bylaws, if further nominations are not received by April 15, the secretary casts the unanimous vote of all regular members of the Association for the election of the candidates nominated by the board. Otherwise, a letter ballot is required.

The following are statements about those nominated for directors.

—Hubert M. O'Haver, secretary

Rea A. Axline

Rea A. Axline attended the U.S. Naval Academy from 1926 to 1928 before entering Caltech and receiving his BS in mechanical engineering in 1931. In 1933 he joined METCO, Inc., manufacturer of Flame Spray (metallizing) equipment, accessories, and supplies in Westbury, New York, and became the company's president and chief executive officer. In 1971 he also became vice president of Perkin-Elmer Corporation in Norwalk, Connecticut. Axline was mayor of Lake Success, New York, and a member of its board of appeals and board of trustees from 1947 to 1955. Since 1971 he has been a member of the board of trustees of Old Westbury, New York, where he now makes his home. Axline is a life member of the Alumni Association.

G. Louis Fletcher

G. Louis Fletcher earned a BS in mechanical engineering in 1956 and an MS in mechanical engineering in 1957. After graduation he taught engineering at the University of Redlands and joined the Grand Central Rocket Company. He then spent seven years with Hydro Conduit Corporation (concrete pipe and products) as chief engineer. For the past six years he has been chief engineer of the San Bernardino Valley Municipal Water District. Fletcher is a member of the Alumni Association and chairman of the 1972-73 long-range planning committee.

John D. Gee graduated with a BS in mechanical engineering in 1953 and joined the Bethlehem Steel Company in its sales training program. Since 1969 he has been assistant manager of sales for Bethlehem in Los Angeles. Gee is a life member of the Alumni Association. He was chairman of the program committee, 1959-60; and member of the board of directors, 1960-62. Gee joined the seminar committee in 1970 and served as chairman in 1971, assistant general chairman in 1972, and is general chairman of the seminar program for 1973.

John D. Gee

Robert B. Grossman

Robert B. Grossman received a BS in mechanical engineering in 1933 and is now president of ASD Properties in South Pasadena. Before joining ASD he was with the Pacific Scientific Company in Los Angeles and the Holly Manufacturing Company in Pasadena. Grossman is a member of the Alumni Association.

Richard A. Karp graduated in 1964 with a BS in mathematics. He then earned an MS at the University of Wisconsin and served in the Peace Corps in the Philippines. Karp is now project leader for the Burroughs Corporation in City of Industry, California. He is a life member of the Alumni Association and was appointed to the Alumni Board communications committee in 1970. He is now chairman of the communications committee and is also a member of the 1973 Seminar Day Program committee.

Leon T. Silver

Leon T. Silver earned his PhD in geology in 1955. Before coming to Caltech, he graduated from the University of Colorado in 1945 and received an MS in geology from the University of New Mexico in 1948. Silver also served in the Navy from 1943 to 1946 and worked for the U.S. Geological Survey during eight field seasons in Colorado and Arizona from 1947 to 1954. He began his graduate work at Caltech in 1952 as a research geologist in the geochemistry of uranium and joined the faculty as an assistant professor in 1955. He has been a professor of geology since 1965 and has played an important role in the Apollo space program, both as an investigator of lunar samples and as a teacher of geology to the astronauts. Silver is a member of the Alumni Association and gave Alumni Seminar Day lectures in 1958, 1967, and 1970. He is also a member of the 1972-73 long-range planning committee.

Richard A. Karp

ALUMNI EVENTS

March 19

Sacramento Chapter Meeting. Terrace Room, the Mansion Inn, 16th and H Streets. Social hour, 6:30 p.m.; dinner, 7 p.m. The Caltech Glee Club will perform.

March 24

Seattle Area Alumni Meeting. The SeaTac Holiday Inn, 17338 Pacific Highway South. Social hour, 6:30 p.m.; dinner, 7 p.m. The Caltech Glee Club will sing.

April 9

Alumni Dinner—Earnest C. Watson Caltech Lecture Series. No-host cocktail hour, the Athenaeum, 6 p.m.; dinner, 6:45 p.m. Speaker—Luis W. Alvarez, professor of physics, University of California, Berkeley. "Where Were the Pharaohs Buried?—Probing the Pyramids with Cosmic Rays." Beckman Auditorium.

May 12

Alumni Seminar Day. Registration, Dabney Lounge, 8:30 a.m.; general sessions, 9:30 a.m. Social hour, the Athenaeum, 5:30 p.m.; dinner, 6:30 p.m. Speaker—Harrison H. "Jack" Schmitt, BS '57.

June 1

Annual Dinner and Class Reunions. Half-Century Club luncheon, the Huntington-Sheraton Hotel, 12 noon; campus tours, 4 p.m.; social hour, the Athenaeum, 6 p.m.; dinner, 7 p.m. Graduating classes of 1968, 1963, 1958, 1953, 1948, 1943, 1938, 1933, 1928, 1923, etc. will be honored.

Developments in lasers reported

Two Caltech professors of electrical engineering reported on important developments in laser beam use at a San Francisco meeting of the Optical Society of America. Amnon Yariv spoke on optical fibers carrying laser beams for use in communications systems. Nicholas George discussed the development of a method to improve holographs.

Yariv predicted that optical fibers carrying laser beams "piggyback" for long distances and around corners will gradually replace metal cables in communication systems. He said that optical fibers can carry vastly larger quantities of information, a single small optical fiber carrying an amount equivalent to two million telephone conversations simultaneously. The frequencies of optical waves, Yariv said, are larger by a factor of about ten thousand than that of electrical currents now in use.

Yariv, an authority on the new field of integrated optics, has been carrying on his research with the cooperation of the Hughes Research Laboratories at Malibu, Calif., and with its staff members Robert Hunsperger and Hugh Garvin. Elsa Garmire of the Yariv Caltech group, who is a senior research fellow in applied science, and two graduate students, Hal Stoll and Sasson Somekh, also contributed to the research, which is supported by the Office of Naval Research, the Advanced Research Projects Agency, and the Nation Science Foundation.

George told the group that he and a graduate student, Atul Jain, are working out a way to suppress the number one problem, a twinkle-like speckling, in the development of three-dimensional laser pictures. They are using multiple-tone lasers, each tone having a different wavelength, to overcome the speckling, which comes from objects whose surfaces are rough on a microscopic scale. It is seen whenever laser light is transmitted through a transparent rough surface. George postulated that using a multiple laser beam of different wavelengths might suppress this effect.

Recommending research toward developing multi-tone lasers, George stated that a multiple laser, emitting beams of 10 to 30 different wavelengths, could yield resolution comparable to that of white light and would improve the field depth greatly. He now plans to apply his technique to electron microscopy where the speckle pattern is caused by a monochromatic electron beam passing through a specimen.

Bill Beranek earned more than PhD

Working for a doctorate is a full-time job and then some for most graduate students, but the PhD Bill Beranek earned last month in chemistry was only one measure of his accomplishments at Caltech.

The trouble is there are no degrees to recognize a graduate student who teaches chemistry to blind students, tutors disadvantaged children in Watts, develops programs to communicate science to nonscientists, and helps worried undergraduates talk out their problems at two in the morning.

But Bill Beranek does not need certificates. Helping people and getting them to interact with each other is no big deal with him. It's simply a way of life. He does what he does because he wants to. Period.

The last thing most graduate students want to do after a long night in the lab is to come back to a house full of noisy undergraduates. But Beranek says it is a good way to unwind. As he puts it, "You walk into the lounge in Fleming at two in the morning, and there's no way you're going to stay uptight."

Although being the RA of Fleming House was not all fun and games, Beranek believes he got as much, if not more out of it than the undergrads. "It's like living in a fish bowl," he says. "You have to stay loose and you have to be honest at all times. You also learn a lot about yourself."

Uncle Bill, as he is known to the Flems, helped bring victories in interhouse competition with his rebounding in basketball and hitting in softball. He made the secret arrangements with the police that cleared the way for the Flems to drag their cannon from Southwestern Academy to campus in the middle of the night. And he led the Flems in their traditional Halloween caroling through San Marino singing the likes of "Pumpkin Bells," "I'm Dreaming of the Great Pumpkin," and "Deck the Patch with Orange and Black," to a not always appreciative audience.

But Uncle Bill also managed to introduce the Flems to such happenings in the outside world as plays, operas, concerts, and projects involved with helping kids in the community. One night he brought over Robert Sinsheimer, chairman of the biology division, for a discussion on the philosophy of science. And he helped the Flems organize a day for a group of sightless high school students who were treated to demonstrations of chemistry they could feel or smell followed by informal rap sessions and dinner in the house.

While a lot of people have good ideas and intentions, what has marked Beranek since he arrived from the University of Wisconsin in 1967 is his ability to follow through and get things done. For example, he was one of three students invited to participate in an international conference of top chemists at Aspen, Colorado, concerned with educating chemists to meet the future needs of society.

When he returned from the conference, Beranek had lunch with James Morgan, professor of environmental engineering, who agreed that Caltech needed a course to express the needs of society in an intelligent and organized fashion to scientists. Beranek then went straight to the then chairman of the chemistry division, George Hammond, and proposed the course. When Hammond said it was a good idea, Beranek said, "What about next semester?" Hammond agreed but said Beranek would have to invite the lecturers.

Beranek succeeded in persuading ten outstanding men, including Caltech president emeritus Lee DuBridge, to give lectures.

Although the "Chemistry and Society" seminars were given without course credit, the lecture hall in Gates was jammed every Wednesday afternoon with faculty and students, and Beranek later edited a book of the lectures that was published.

In 1969 Beranek suggested a committee for closer relations between the faculty and graduate students. Out of that committee came a summer program for 22 disadvantaged junior high school students that was organized by Beranek and Jerry Pine, professor of physics, and other faculty members. Professors volunteered to give lectures and lab demonstrations in biology, physics, and chemistry during the eight-week program, and Beranek was one of the counselors who lived with the students in a dorm.

"What we tried to do was motivate the kids to be more excited about living," Beranek says. "Science was just our mechanism."

In connection with his interest in the high school science program, Bill managed to take off about once a week to talk and put on demonstrations before high school science classes in the southern California area.

Near the end of his lecture, Bill let the kids come up and do experiments of their own with the chemicals he provided for them. He says he only had one problem with this procedure at Locke High School in Watts. It seems one girl was discovering what things burned and what things didn't burn, while a boy next to her was making nylon with solvents that included gasoline.

"The girl found her answer when she lit the gasoline and the teacher panicked and ran for the fire extinguisher," Bill says. "The fire was out by the time the teacher figured out how to pull the pin, but then he blasted everything off the table."

In addition to his chemistry lectures, Beranek also tutored in Watts, was a volunteer in Pasadena's Head Start program, taught English to Cuban refugees, and became highly important in the life of a three-year-old who badly needed a father or uncle figure to tie to.

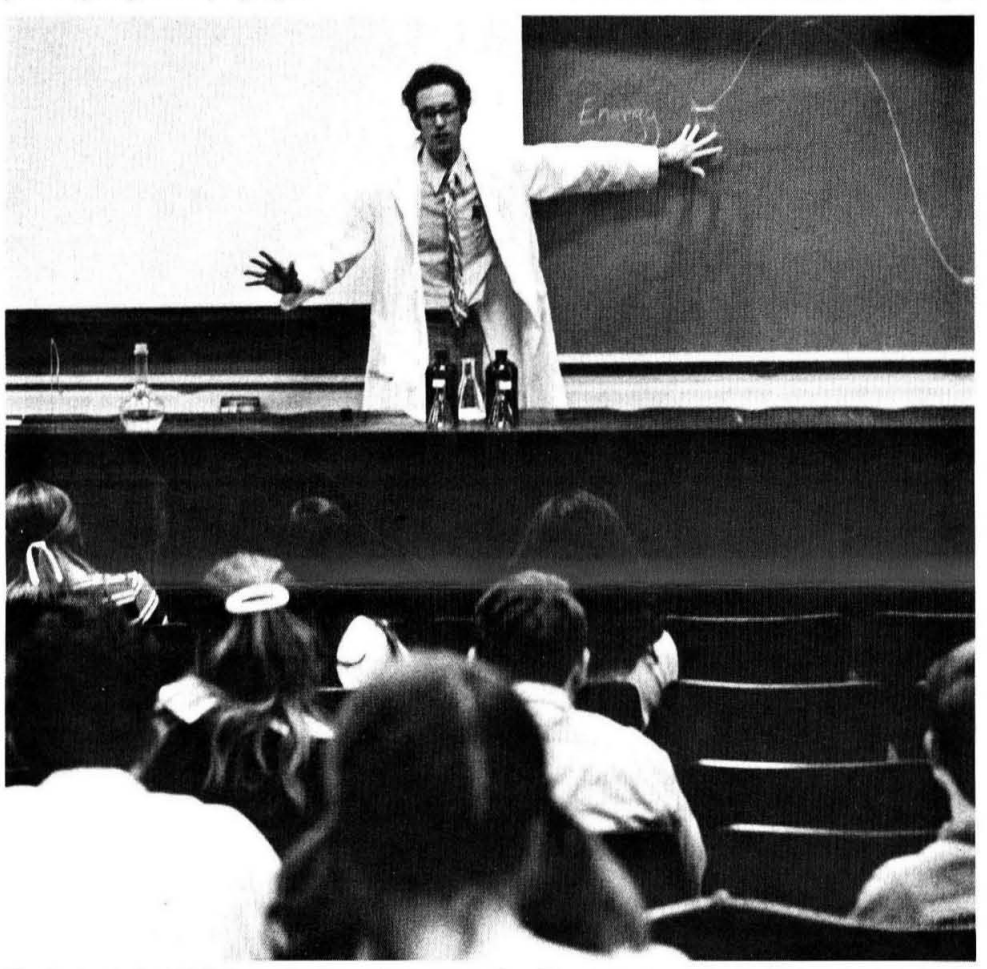
Although Beranek enjoys research and will do two years of postdoctoral work in biochemistry at Duke University Medical School, he still regards science as a means to help people rather than an end in itself. "If people have to pay for our research," he says, "then I think we should try to do something that will benefit people."

In his efforts to communicate chemistry to the nonscientist, Beranek serves as a science consultant to "Sesame Street" and is planning to write a college chemistry textbook for nonscientists.

As for the future, Bill is keeping his options open. "I don't know what I'll be doing five years from now," he says. "I have the feeling the job hasn't been invented yet."

Meanwhile, Beranek plans to continue his present style of life. On the way back to North Carolina, he will stop to spend two days at a Navaho Indian reservation to see how the people live and maybe give a chemistry demonstration at the local school. Then he will go up to North Dakota to visit an Indian boy he is helping to support.

Beranek says his final destination will be a cabin in the quiet woods of North Carolina, where he plans to come home after his research work at Duke and write books. But his plans have a way of changing and we are willing to bet the cannon in front of Fleming House that Duke University and North Carolina will never be the same after Bill Beranek arrives.



Graduate student Bill Beranek gives a lecture on chemistry to group of junior high school students.

Calendar

Fri. & Sat., Mar. 2 & 3, 8 p.m. Beckman CARLOS MONTOYA, flamenco guitarist, $6-5.

Saturday, Mar. 3, 11 a.m. & 2 p.m. Beckman. CHILDREN'S SERIES: Heiken Puppets present "Pinocchio." Adults, $2; children, $1.50.

Sunday, Mar. 4, 8 p.m. Dabney Lounge DABNEY LOUNGE CHAMBER MUSIC CONCERT, featuring Jonathan Mack (tenor) and Bruce Ferden (piano), performing Schubert's Die Schöne Müllerin, Opus 25. Free.

Saturday, Mar. 10, 8 p.m. Beckman YONG UCK KIM, violinist. $5-4-3-2.

Monday, Mar. 12, 8 p.m. Beckman EARNEST C. WATSON CALTECH LECTURE SERIES: "What Price Speed? —Propulsion in Micro-Organisms," Theodore Y. Wu, professor of engineering science, Caltech. Free.

Thursday, Mar. 15, 8 p.m. Beckman JULIAN BREAM, guitarist & lutanist. $6.75-5.75-4.50.

Sunday, Mar. 18, 3:30 p.m. Beckman COLEMAN CHAMBER MUSIC CONCERT: Quartetto Italiano performing music by Boccherini, Bartók, and Ravel. $5-4-3-2.50; students, $1 discount.

Sunday, Mar. 25, 2 p.m. Beckman ARMCHAIR ADVENTURES MINI-SERIES: "Germany," narrated by Kenneth Richter. $3-2.50.

Monday, Mar. 26, 8 p.m. Beckman EARNEST C. WATSON CALTECH LECTURE SERIES: "The Search for a Black Hole in Space," Kip Thorne, professor of theoretical physics, Caltech. Free.

Friday, Mar. 30, 8 p.m. Beckman ARMCHAIR ADVENTURES: "Yankee Sails Scandinavia," narrated by Captain Irving Johnson. $3-2.50, single tickets only.

Saturday, Mar. 31, 8 p.m. Beckman THE NATIONAL SHAKESPEARE COMPANY in Sophocles' *Antigone*. $5.50-4.50-3.50-2.50; students, $1 discount.

Sunday, Apr. 1, 2 p.m. Beckman ARMCHAIR ADVENTURES MINI-SERIES: *Yankee Sails Around the World*, narrated by Captain Irving Johnson. $3-2.50.

Friday, Apr. 6, 8 p.m. Ramo YOUNG CONCERT ARTIST SERIES: Joy Blackett, mezzo-soprano. $3; students, $2.

Saturday, Apr. 7, 8 p.m. Beckman Greek folk singer NANA MOUSKOURI and the Athenians in a program of international music and song. $6.75.

Sunday, Apr. 8, 3:30 p.m. Beckman COLEMAN CHAMBER MUSIC CONCERT: Ralph Kirkpatrick, harpsichordist. $5-4-3-2.50; students, $1 discount.

Monday, Apr. 9, 8 p.m. Beckman EARNEST C. WATSON CALTECH LECTURE SERIES: "Where Were the Pharaohs Buried?—Probing the Pyramids with Cosmic Rays," Luis D. Alvarez, professor of physics, UC Berkeley. Free.

Alumni Fund Council expects to meet campaign goals

Caltech's Alumni Fund Council met on campus in mid-January to evaluate the progress made so far in reaching the goals of the 1972-73 Alumni Fund and to make plans to reach all alumni who have not yet contributed before the close of this year's campaign on June 30.

It was announced at the council meeting that as of January 2, 1973, a total of 848 alumni have contributed $273,839 to the Fund. The goals established for the 1972-73 Alumni Fund by the council call for contributions from 3,500 of Caltech's 11,500 alumni and a total goal of $300,000.

Donald D. Davidson, BS '38, chairman of the council, said, "I think everyone who has worked on this campaign so far can be proud of their accomplishments."

Praising the generosity of alumni who have been the earliest to contribute to the Alumni Fund, Davidson said, "The contributions of these alumni have developed a firm foundation on which we can build our final efforts to reach our goals for 1972-73.

"We are now nearing the Fund's dollar goal," he said, "but we still have a long way to go before we reach our goal of alumni contributors."

"We're counting on every alumnus to evaluate what his Caltech experience has meant to him and to make a gift based on that evaluation. If each alumnus will do this, I am confident the Alumni Fund will reach its goals by June 30."

Members of the Alumni Fund Council, in addition to Davidson, are Horace W. Baker, BS '35; Frank W. Davis, BS '36; J. Benjamin Earl, BS '44; Patrick J. Fazio, '53; Stephen H. Garrison, BS '65, MS '66; Burton Jones, Ex '22; Robert J. Kieckhefer, BS '45; Artur Mager, PhD '53; John L. Mason, BS '47, MS '48, PhD '50; Reuben B. Moulton, BS '57; Stanley R. Rawn, Jr., BS '52, MS '53; Robert P. Sharp, BS '34, MS '35; Harrison W. Sigworth, BS '44; and Charles Thomas, BS '35.

Get'em Totem

Totem, Caltech's occasional literary-art anthology, is on the loose again with another collection of short stories, poems, photographs, and drawings, appropriately entitled *A Winter's Totem*. Alumni and friends of the Institute are invited to view the creative works of students and other members of the Caltech community by purchasing a copy for sixty cents. Please mail your requests to *Totem*, Winnett Center 105-51, Caltech, Pasadena, California 91109. Contributions (creative or otherwise) are welcome.

Caltech spring sports season begins

It's spring sports time again and here's how Caltech's teams are beginning to shape up for the new season.

TRACK

"We have five outstanding men and three who are very good," says coach Bert LaBrucherie, "but we just don't have enough people to do very well in the dual meets."

Despite the team's lack of depth, particularly in the sprints and field events, LaBrucherie expects some outstanding individual performances this year.

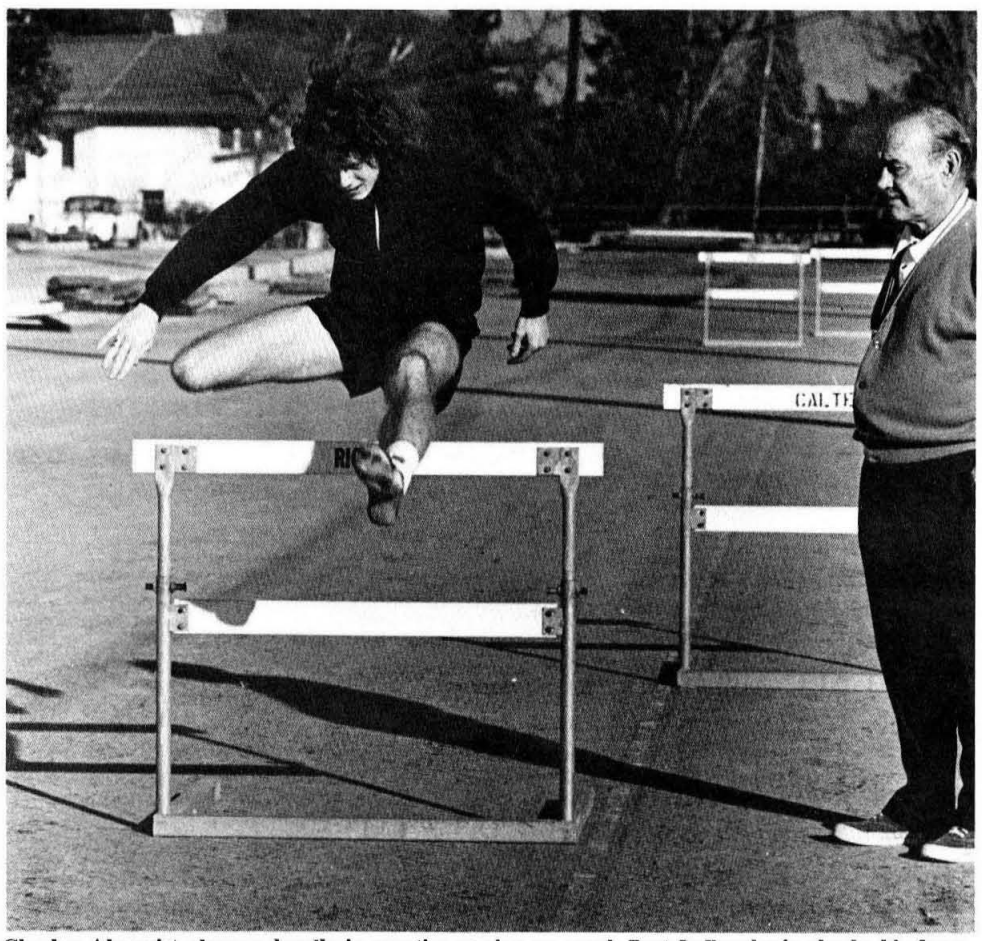
High on the list of potential stars is junior Alan Kleinsasser, who holds the school records in the 880 and mile runs and won the SCIAC championship last year. If Kleinsasser continues to improve, he should be a good bet for the NAIA District III title and could have a crack at a national championship.

Charley Almquist, a senior, broke the school record in the 440-yard intermediate hurdles last year and was undefeated in dual meet competition. He should better his third-place, all-conference performance in the intermediates and will also be counted on to bring Caltech points in the high hurdles and the 440-yard dash, as well as carrying a baton in the 440 and mile relays.

Junior Haywood Robinson came into his own in the SCIAC meet last year with a 9.8 clocking that was good for a third-place finish in the 100-yard dash. LaBrucherie is counting on him to do well in both the 100- and 220-yard sprints and also to help the team in the 440-yard relay and the long jump.

Two sophomores who could turn into conference champions this year are Greg Hoit and Greg Griffin. Hoit set a school freshman record in the 440-yard dash and also reached the conference finals in the 440 hurdles. Griffin set frosh marks in the two- and three-mile runs last year and had an outstanding cross-country season this fall. La Brucherie believes Griffin may now have the speed he needs to win conference titles and place high in NAIA competition.

Freshmen Brad Page, Brent Sweitzer, and Terence Mills are expected to add some points in the field events. Page and Mills compete in the high jump, an event that Caltech was blanked in last year, and Page also throws the javelin. Sweitzer is already throwing the shot 45 feet and is also doing well in the long jump. Steve Bienz, who is back after a three-year absence, will also help in the shot and discus events. LaBrucherie has been impressed by the 140-foot discus throws of sophomore Doug Herbert, and is hopeful that junior Barry Cipra will master the pole vault well enough to collect some points this season. Sophomores Dave Webster and John Steubs could do well in the quarter mile and Webster will also compete in the long jump.



Charley Almquist clears a hurdle in practice session as coach Bert LaBrucherie checks his form.

GOLF

Harold Cassriel, a stockbroker who coaches Caltech golfers as a hobby, figures this will be a year for developing new players.

Gone are last year's stars Jim Simmons, who was third in NAIA District III play, and Roger Goodspeed, the team captain who was named to the all-conference team for two years.

Stephen Poon, a junior transfer who played for Occidental last year, will be captain and Number One player this season. Cassriel is hoping that freshmen Ron McMaster and Mark Lampkin will be the Two and Three men, with returning sophomores Joe Fahle and Phil Nygren in the Four and Five spots. All players will have trouble making all the matches this year and Cassriel is still looking for some more talent.

TENNIS

Caltech's chances in tennis will rest with four returning lettermen—senior Bruce Eisenhart, the team captain, and sophomores David Dummit, Mamoru Nakatsui, and David Beatty. Dummit was the second man on last year's squad which finished with a 7-11 mark in conference play.

Coach John Lamb says, "We're hoping for the best, but it's a tough schedule." Toughest in the conference again should be Redlands, the defending NAIA team champion, but Caltech still has an outside chance to get over the .500 mark this year if the lettermen improve on their performances of last season.

BASEBALL

With most of the top players returning from last year's team and a talented group of freshmen among the 21 players turning out for practice, this could be one of the best seasons in recent years for Caltech baseball.

Tom Howell, a senior who hit .367 and won the NAIA's Gene Waldron Memorial Award last year, is expected to lead the Beavers at the plate. Phil Gschwend, another senior, who was co-winner with Howell of the Caltech Alumni Trophy as the outstanding baseball player last season, will bear the brunt of the pitching duties again.

Jerry Feely, a senior who was all-conference two years ago but did not play last year, will strengthen Caltech's infield at second base along with freshman John Diller at shortstop and Rene Johnson at first base. Another freshman, Tony Durazo, is expected to fill the catcher's slot, which will give a rest to Gschwend who had to work behind the plate when he wasn't pitching last season.

Other players who look like starters in Coach Ed Preisler's lineup include Bob Pleva, a junior who will move from shortstop to left field; sophomore Doug Schladweiler, a first baseman last year who will move to right field; and Dick Short, a senior who will return to his third-base position. Sophomore Rick Mitchell and senior John Ellis could also provide some depth in pitching.

Some freshmen who will see action this season include pitcher Larry Bond, outfielders Eric Horsley and Pete Theissen, and infielder Bob Linderman. Don Franks, back after two years, could also break into the lineup.

Although Coach Preisler is not making any predictions, it is clear that he expects his team to do better than last year when it won only one game. In addition to his able assistant coach Dean Bond, Preisler said he has been getting some valuable help in coaching this season from grad students Jim McCardle and Lou Sandler.

Student Views

ROTC offers unique opportunities

"ROTC is something you have to see to believe. It provides an outlet for the martyrs among us." So reads the perennial warning printed in the Caltech *little t*. I'd agree with the first statement, but no martyr ever found his way into the Air Force Reserve Officers Training Corps (AFROTC). I know the people in the program and hope that more and more they will make themselves seen.

Air Force aerospace studies have been at Caltech for just over 20 years. A traditional "low profile" has so characterized the program that even today people who have been here just as long are unaware of AFROTC presence.

There are almost as many reasons for enrolling in the program as not. Draft pressure has long been the central motive compelling students to join. Yet not given this *a priori* pressure, few students even bother to investigate the program. Consequently, rumors propagate about unpleasant commitments and assignments forced on those who enter.

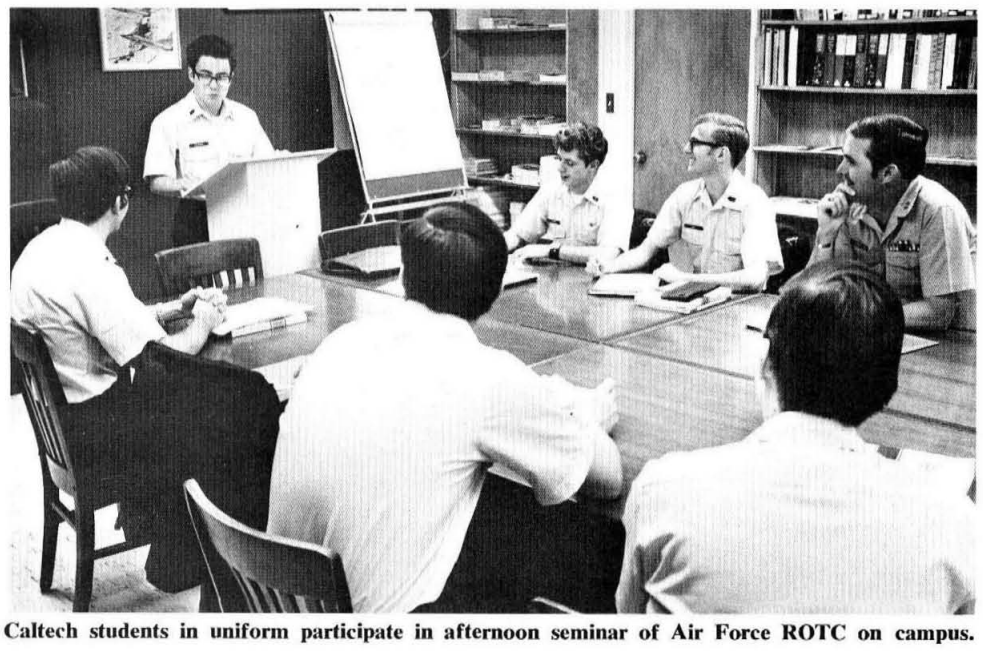
I enrolled in the AFROTC program because I felt that a determined officer could find what he was looking for in the diversity of career options available. At first, I did find myself unsure about the desirability of life in the military. Spending last summer at a field training session helped to settle many of these doubts. True, the Air Force is clearly no Utopia, but neither is any society.

The direct exposure others like myself receive provides an invaluable insight into our much-talked-about, but poorly understood, military system. I really believe that the problems and challenges facing members of today's armed forces differ little from those of all Americans.

How does AFROTC involvement affect more immediate personal goals and plans? Aside from a four-year active-duty commitment, each student enrolled is required to take Air Science courses during his two years in the program. Their relevance is a controversial issue, especially to those who find them an encroachment upon their academic schedule. Certainly an enrollee must expect to sacrifice some hours each week, yet the courses are potentially rewarding to anyone sincerely interested. Their most remarkable aspect is the participation they demand of those enrolled. Students are required to run seminars themselves. Each has his turn and in time a spontaneous exchange takes place at each class.

A new kind of student seems to be taking an interest in AFROTC now. As the draft pressure recedes, more and more are looking at it as more than just a "way out." AFROTC graduates from Caltech have found very challenging careers awaiting them. One was C. Gordon Fullerton, a class of '57 member who later became an astronaut. The challenge of an Air-Force career lies not in any mythical pretensions that the service is an ivory tower wherein every opportunity sits upon a silver platter. Rather it stems from the need to keep the organization responsive to the needs of its own members and of the country that supports it.

Mike Schroeder, '74



Caltech students in uniform participate in afternoon seminar of Air Force ROTC on campus.

Placement Assistance To Caltech Alumni

The Caltech Placement Service may be of assistance to you in one of the following ways:

(1) Help you when you become unemployed or need to change employment.

(2) Inform you of possible opportunities from time to time.

This service is provided to alumni by the Institute. A fee or charge is not involved. If you wish to avail yourself of this service, fill in and mail the following form to:

Caltech Placement Service
California Institute of Technology
Pasadena, California 91109

Please send me: (Check one)

☐ An application for placement assistance

☐ A form indicating a desire to keep watch for opportunities although I am not contemplating a change.

Name .....

Degree(s)..... Year(s).....

Address.....

.....

PERSONALS

1925
C. G. McPROUD has retired. He was chief engineer of Justi-Meter Corporation.

1926
TED COLEMAN, the city manager of South Pasadena, has had his contract renewed for two years by the city council. Coleman, the founder of the Coleman Engineering Company, came out of retirement last year to accept the city manager position. He has lived in South Pasadena since 1950 and served as chairman of the Downtown Revitalization Committee before assuming his present job.

1927
J. DAVIS SHUSTER reports, "I retired last September but, as everyone says, still busy. Went to Switzerland and was glad I was driving a VW rather than a Continental between St. Moritz and Chur."

W. LAYTON STANTON, PhD '31, retired as director of exploration for Union Oil after 36 years with the company. He reports, "Sally and I are living in Balboa and spend an occasional week at our almond ranch at Paso Robles and do considerable traveling."

1929
PHILIP G. MURDOCH, PhD '32, formerly a laboratory division leader with the Dow Chemical Company, is now retired.

1930
H. RICHARD CRANE, PhD '34, has been named the George P. Williams University Professor of Physics at the University of Michigan. He is a fellow of the American Physical Society of the American Association for the Advancement of Science, a member of the National Academy of Sciences, and a member and past president of the American Association of Physics Teachers. Crane is now chairman of the American Institute of Physics and a member of the standing committee on controlled thermonuclear research of the U.S. Atomic Energy Commission.

1936
VICTOR VEYSEY, who is serving his second term as U.S. Congressman from the 38th District in California, has been appointed to the House Appropriations Committee.

1938
FREDERICK LLEWELLYN, president and general manager of Forest Lawn Memorial Parks and Mortuaries, has been elected president of the Los Angeles Area Chamber of Commerce. He succeeds outgoing president W. MORTON JACOBS, BS '28. Llewellyn was president of the Los Angeles Junior Chamber of Commerce in 1950.

1940
CLAUDE E. DAVIS has retired from active business and has set up a guest ranch for salmon fishermen at the mouth of the Columbia River. He writes, "Business executives can arrange to bring a small party to Hammond, Oregon, where they become my personal house guests. We fish the Pacific for chinook and coho salmon from my yacht, the *King's X*."

1941
ROBERT F. MYERS, vice president of Bechtel International Corporation, has moved from Mexico to Los Angeles.

JOHN G. PALMER is now chief engineer of Caribe Circuit Breaker in Isla Verde, Puerto Rico. He was chief engineer of Zensco Electrical Products.

1944
ROBERT E. LAUTERBACH has been promoted to sales manager of Gates Division of Harris Intertype in Quincy, Illinois.

1947
LATHAM L. BRUNDRED, formerly president of Innerspace Science Corporation, is now president of Brittain Industries, Inc., in Tulsa, Oklahoma.

JAMES S. WIGGS writes that he has retired as owner of Wiggs Construction Company and is now cruising the world with his wife Betty, on a 50-foot sailboat called "Away."


Temin '60


Leonard '64

1948
BRUCE A. WORCESTER is now manager of manufacturing for Newport News Shipbuilding in Virginia. He was general manager of Pactra Industries in California.

1949
HEINZ PFEIFFER, PhD, formerly with General Electric Research and Development, is now manager of technology and energy assessment for Pennsylvania Power and Light Company in Allentown.

1951
CARL A. HIRSCH is now assistant chief of the clinical pathology service at the Veterans Administration Hospital in San Francisco. He was formerly assistant professor of medicine at the Harvard Medical School.

JOHN H. LOBDELL, a retired navy captain, is now teaching business administration, business technology, and data processing at Clackaman Community College in Oregon City, Oregon.

LAWRENCE V. SOKOL is now engineer for MCA Disco-Vision, Inc., in Torrance, California. He was formerly with Dynasonic Corporation.

1952
RICHARD H. FULLER, formerly with Univac, is now general manager of Sperry Rand Research Center in Sudbury, Massachusetts.

1953
ALAN M. HAIRE, MS '54, is now a member of the technical staff of Mechanics Research, Inc. of Los Angeles. He was with Survival Systems, Inc.

1954
RONALD S. RATNEY is a chemist with the Massachusetts Division of Occupational Hygiene in Boston. He did his training at the Harvard School of Public Health.

1955
ALVIN W. TRIVELPIECE, MS, PhD '58, formerly professor of physics at the University of Maryland, has joined the Atomic Energy Commission as an assistant director of the division of controlled thermonuclear research. He is responsible for basic plasma research conducted for AEC at universities, national laboratories, and by private industry.

1956
CHARLES O. PEINADO, MS, is now project manager for Gulf General Atomic in San Diego. He was resident engineering manager for Allied Gulf Nuclear Service.

1957
EDWIN X. BERRY, formerly with the University of Nevada's Desert Research Institute, is now program manager of ESR/RANN for the National Science Foundation in Washington.

HARRISON H. SCHMITT writes from NASA in Houston, Texas, "Made it to the moon and back December 6 through 19 on the last Apollo, *Apollo 17*. Many thanks to Caltech for its support and help."

1958
CLAUDE D. FIDDLER, MS, is senior representative for California Asiatic Oil Company, a subsidiary of the Standard Oil Company of California. He writes, "I represent SOCAL in a five-company consortium now engaged in exploring and developing a 144,000 square mile, off-shore concession in Western Australia—five gas discoveries have been made to date."

1959
ARNOLD I. GOLDFORD, formerly with McDonnell Douglas Astronautics, is now senior systems engineer with United Technology Center in Sunnyvale, California.

DENNIS L. PAULL, MS '62, is a senior engineer with Varian Associates in Palo Alto, California.

1960
SAMUEL BERGMAN completed his PhD in computer science at the University of Pennsylvania and is now on the faculty of Temple University. He has also had a textbook, *Introduction to Computers and Computer Programming*, published by Addison-Wesley.

HOWARD M. TEMIN, PhD, Alumni Research Foundation Professor of Cancer Research at the University of Wisconsin, is one of ten medical educators and researchers who have received 1973 Awards for Distinguished Achievement from *Modern Medicine*, a leading national medical journal. Temin was cited "for vital research in biochemical genetics in relation to oncology."

1961
CLEVE B. MOLER, formerly associate professor at the University of Michigan, is now associate professor of mathematics at the University of New Mexico.

1962
RONALD D. BERCOV, PhD, is now an associate professor at the University of Alberta in Canada. He was a visiting professor at Caltech.

CHARLES H. RADOY, a captain in the Air Force, is now doing graduate work at the University of Florida.

1964
BRUCE J. ABORN, MS, formerly a graduate student at UC Berkeley, is now a teaching assistant at Ohio University in Athens, Ohio.

MARK N. GURNEE has been appointed principal research scientist at Honeywell, Inc., St. Paul, Minnesota. He was previously a research associate in engineering at Brown University.

CHARLES F. LEONARD has opened a private practice in psychiatry in Nyack, New York. He completed his intern work at Albany Medical Center Hospital.

ROGER L. MINEAR was married on New Year's Day to Loretta Ann Incollingo in Wyomissing, Pennsylvania. Minear is a member of the technical staff of Bell Telephone Laboratories.

1965
ROGER S. SCHLUETER, MS, PhD '69, formerly with the General Research Corporation, is now an oceanographer with Marconsult, Inc. in Santa Monica, California.

1966
JARED A. AUSTIN completed his graduate work at the University of Chicago and is now a research chemist for DuPont in Wilmington, Delaware.

1967
DONALD G. BLAIR is a postdoctoral research fellow in the department of microbiology at the USC School of Medicine. He did his graduate work at UC San Diego.

JAMES E. PEARSON, PhD '72, completed three months' active duty with the Air Force at the space and missile systems organization in El Segundo and is now with the Los Alamos Scientific Laboratory in New Mexico. He writes, "I am working in nonlinear optics and solid-state laser development as part of the laser-fusion program. My wife, Nanci, and I are expecting our second child in April of this year."

1971
JAMES E. JUSTISS completed his graduate work at the University of Texas and is now an associate computing analyst at Caltech.

WESLEY E. MUNSIL is studying at Churchill College, Cambridge University, England, on a Winston Churchill Foundation Scholarship—one of only eight or ten given each year in the U.S.

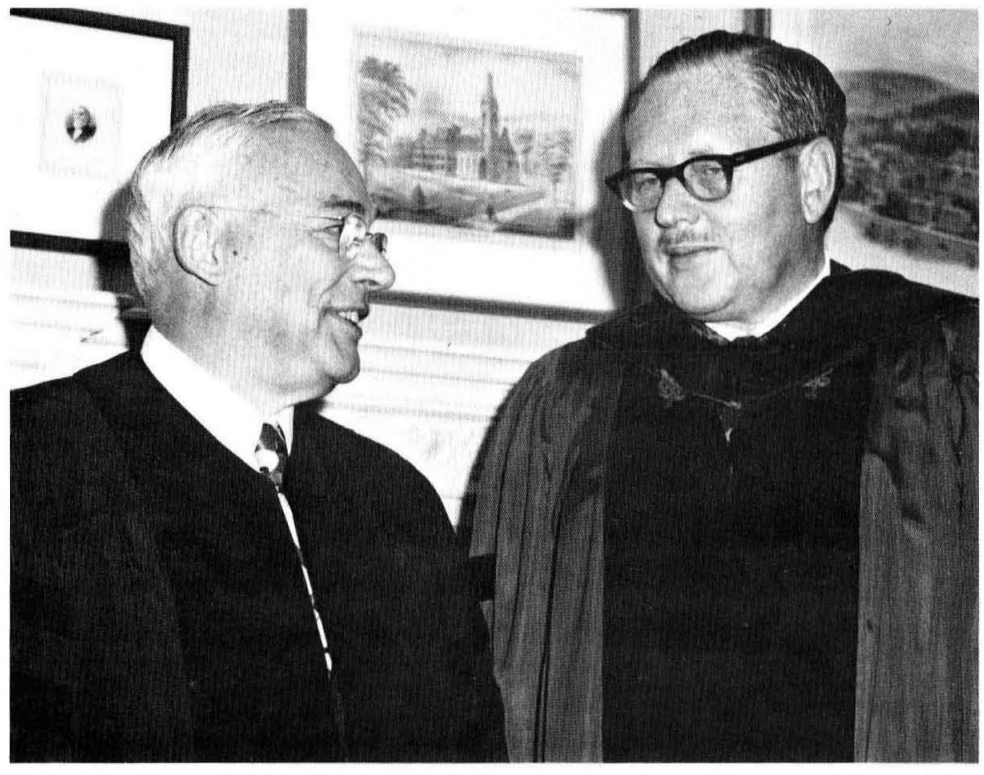
PATRICK H. NETTLES, PhD, formerly a physics instructor at the University of North Carolina, is now a senior physicist with Scientific-Atlanta Company in Atlanta.

BRUCE SINCLAIR, MS, is a junior electrical engineer with the Southern California Edison Company.

SAMUEL WARD, PhD, has been appointed to the faculty of the Harvard Medical School as an assistant professor of biological chemistry.

1972
ROBERT K. LEWIS is a visiting instructor in physics at the College of Creative Studies, UC Santa Barbara.

RAPHAEL LOEWY, PhD, is a research associate at the Mathematics Research Center of the University of Wisconsin.


Richard G. Folsom, BS'28, MS'29, PhD'32, (left) president emeritus of Rensselaer Polytechnic Institute, was presented an honorary DSc degree by Lehigh University president W. Deming Lewis.