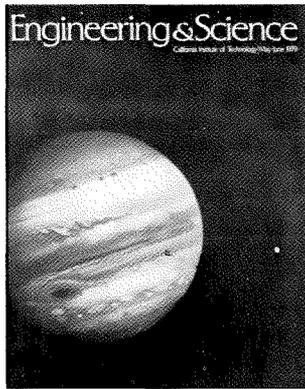


# In This Issue



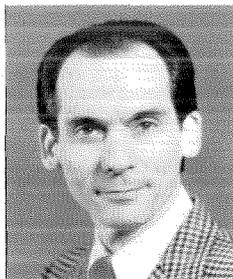
## By Jove

On the cover — the largest planet in the solar system, Jupiter, with the Great Red Spot showing near its lower left edge. This photograph was taken by Voyager 1 on February 5, when the spacecraft was a month and 28.4 million kilometers (17.5 million miles) from its closest encounter with the giant planet. Two of Jupiter's four largest satellites are also visible. Io, the innermost satellite, appears as a dark spot not far from the right edge of the planet and just south of the equator. Europa is the white dot near the right edge of the photograph.

This is only one of thousands of spectacular images sent back to Earth by Voyager 1's cameras. And while those pictures delight the eyes of most of the general public, they are mind-boggling for the equally delighted space scientists — suggesting both answers to old questions and new problems to be solved.

Edward C. Stone, whose own research interest is cosmic rays, has been NASA's Project Scientist for the two Voyager space missions since 1972, which means that he coordinates Voyager's scientific studies. These days he is deeply involved with the minute-by-minute plans for Voyager 2's encounter with Jupiter in July.

Stone came to Caltech as a research fellow in 1964 after receiving his PhD at the University of Chicago, and he has gone steadily up in the academic ladder ever since, becoming professor of physics in 1976. Recently, he has found himself in-



Edward C. Stone

creasingly in demand as a Voyager interpreter — for TV, radio, and newspaper reporters, for other scientists, for an assortment of groups, and for *E&S*. "Voyager 1 at Jupiter: An Encounter with Five New Worlds" on page 3 is his informative account of this mission.



Judith Goodstein

## Birthdays Greetings

One of the most important events of the year 1879 was the birth of Albert Einstein, an anniversary that was celebrated in 1979 by all kinds of people, in diverse ways, and in a number of places. At Caltech, students gave a giant block party (*E&S*, March-April), a tongue-in-cheek appeal for funds for an Einstein memorial was circulated (see page 27), and archivist Judith Goodstein mounted a handsome Einstein display in the cases in Millikan Library's foyer.

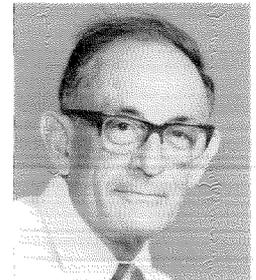
Goodstein also mounted several platforms to speak on various aspects of Einstein's life and career and particularly on his experiences during the three visits he paid to Caltech in the early 1930's. "Albert Einstein in California" on page 17 is adapted from the talks she gave recently at Santa Barbara City College and for the Caltech Y's Evening Spotlight Series.

Goodstein has been Caltech's archivist ever since 1968 when she came here from the University of Washington where she had just earned a PhD in the history of science. Under her direction Caltech's rather small and disorganized miscellany of archival material has grown to more than 60 research collections, about 500,000 documents, 5,000 photographs, 100 pieces of scientific apparatus, and 500 sound recordings. Her latest project is collecting oral histories of the early days of Caltech from the people who were here to observe them.

## A Case Study

One of the trends in education these days is a growing movement of college students into engineering options — a fact that makes evaluating and upgrading engineering education of prime importance to concerned educators. Fortunately, that process is not new to the faculty members of GALCIT (the Graduate Aeronautical Laboratories of the California Institute of Technology), who have been analyzing their educational system and its results for several years. In fact, last fall GALCIT's director, Hans Liepmann, was invited to lecture on the subject at the Second International Congress of Engineering Education in Darmstadt, Germany. "Engineering Education for a Rapidly Changing Technology" on page 20 is an adaptation of that talk.

Liepmann's qualifications for giving such a talk are impressive. He has been associated with engineering research and education ever since he came to Caltech in 1939 as a research fellow. He became a full professor in 1949, director of GALCIT in 1972, and Charles Lee Powell Professor of Fluid Mechanics and Thermodynamics in 1976. The receiving of a named chair was, of course, one recognition of his many contributions to aeronautical and engineering research. He has had many others as well, including election to both the National Academy of Engineering and the National Academy of Sciences. He has also been awarded the Ludwig Prandtl Ring, the highest distinction of the German Society for Aeronautics and Astronautics, the Worcester Reed Warner Medal of the ASME, and the Monie A. Ferst Award.



Hans Liepmann

STAFF: *Editor and Business Manager* — Edward Hutchings Jr.  
*Managing Editor* — Jacquelyn Bonner  
*Photographer* — Richard Kee

PICTURE CREDITS: Cover, 3-9 — NASA/2, 25-26 — Richard Kee/  
24 — Floyd Clark.

Engineering & Science is published five times a year, September-October, November-December, January-February, March-April, and May-June, at the California Institute of Technology, 1201 East California Boulevard, Pasadena, California 91125. Annual subscription \$5.00 domestic, \$7.50 foreign, \$15.00 foreign air mail. Single copies \$1.00. Third class postage paid at Pasadena, California. All rights reserved. Reproduction of material contained herein forbidden without authorization. © 1979 Alumni Association California Institute of Technology. Published by the California Institute of Technology and the Alumni Association.