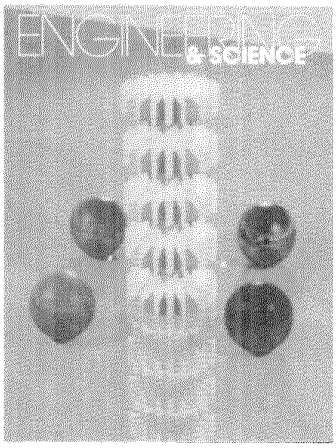
In This Issue



Graphic Description

On the cover — a computer graphics image generated by Monte Carlo ray tracing. Ray tracing is a set of algorithms that computes reflection and refraction of individual rays of light off surfaces. More than 15 million rays were shot to make this picture, and Jim Kajiya, assistant professor of computer science, used 36 hours on an IBM 4341 to do it. The gear was specified as the boolean intersection of two solid primitives, a 20-pointed prismatic star, and a surface of revolution.

Kajiya, along with Al Barr, also assistant professor of computer science, and Jim Blinn, lecturer, who currently splits his time between JPL and "The Mechanical Universe," form the core of what is probably the most mathematically sophisticated computer graphics group in the country. Computer graphics at Caltech is relatively new (the field itself is only 20 years old), but progressing by leaps and bounds and with much enthusiasm. Some of their current work is described and illustrated in "Computer Graphics," beginning on page 11.

Just Joking

Few members of the Caltech community are likely to recognize Richard Feynman under the title "The Dignified Professor." But it's indeed Feynman, now the Richard Chace Tolman Professor of Theoretical Physics and Nobel laureate, recounting his initial experiences as a faculty member at Cornell (before his Caltech affiliation began in 1950).

"The Dignified Professor," which begins on page 4, is one chapter of a book of reminiscences, *"Surely You're Joking, Mr. Feynman," Adventures of a Curious Character*, scheduled for publication in January 1985 by W. W. Norton & Company, Inc. The stories that make up the book were taped by Ralph Leighton "intermittently and informally during seven years of very enjoyable drumming" with Feynman. Former *E&S* editor Ed Hutchings edited the collection.

In his introduction Al Hibbs, senior member of the technical staff at JPL, describes the memoirs as giving a true picture of much of Feynman's character "— his almost compulsive need to solve puzzles, his provocative mischievousness, his indignant impatience with pretension and hypocrisy, and his talent for one-upping anybody who tries to one-up him! This book is great reading: outrageous, shocking, still warm and very human."

New Wave

David Rutledge, who invented the first millimeter-wave imaging antenna array, describes his research developing this new technology of tiny antennas and detectors in "Integrated Circuits for Millimeter Waves." This work will make millimeter-wavelength radiation a much more useful resource for imaging applications in fusion research, radar, and astronomy. The article, which begins on page 19, was adapted from his Seminar Day talk last May.

Rutledge, associate professor of electrical engineering, is one of 200 scientists nationwide (eight at Caltech) selected as recipients of the first Presidential Young Investigator Awards, which subsidize promising and original research. He has also received an IBM Faculty Development Award (as has Al Barr, pages 11-18).

Rutledge has been working in the field of infrared and millimeter devices, mostly in industry, since 1976. He received his PhD from UC Berkeley in 1980, the same year he came to Caltech. His BA is from Williams College and MA from Cambridge University.

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