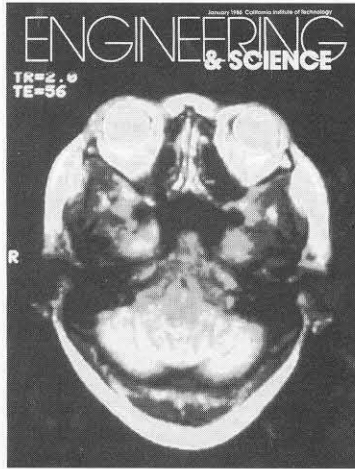


# In This Issue



## Magnetic Magic

On the cover — an NMR image of the brain in transaxial section taken through the middle of the eyeballs and ears. The colors are false, and their gradations from white through magenta to red to black represent combinations of proton density and rates of relaxation by which NMR differentiates among various kinds of tissue. NMR stands for nuclear magnetic resonance, a laboratory technique used for 40 years to study a wide variety of molecular properties. In “Biomedical Applications of NMR,” beginning on page 10, Institute Professor of Chemistry John D. Roberts explains how NMR works and how the technique has been applied in recent years to the imaging of biochemical processes in human beings. The article was adapted from his Seminar Day talk last May.

Roberts is one of the pioneers of NMR applications to chemistry and biochemistry. After earning his BA (1941) and PhD (1944) from UCLA, Roberts came to Caltech in



1952 and has been professor since 1953. His work demonstrated with extraordinary clarity the power of NMR as a tool for studying molecular structure and dynamics. Said a colleague, “If Roberts had not entered the field of NMR at an early stage, I believe that the field would have

developed differently and far less effectively.” He has also served as division chairman (1963-68) and provost and vice president (1980-83).

## Spaceman Wang

As the first (and only) scientist-astronaut from Caltech’s Jet Propulsion Laboratory to fly on the space shuttle, Taylor Wang has been in great demand to recount his experiences — including a warm welcome in his native China. His good-natured wit in describing his life as an astronaut delighted his Watson Lecture audience at Caltech last October; that talk, “A Scientist in Space,” is adapted here beginning on page 17.

Born in Shanghai, Wang came to the United States via Taiwan and earned his BS, MS, and PhD degrees in physics at



UCLA. He’s worked at JPL since 1972 where early on he recognized the potential of zero gravity in doing containerless

experiments. He invented the acoustic levitation and manipulation chamber in the drop dynamics module for investigating fluid behavior in space. When this experiment balked on Spacelab 3, Wang spent 2 ½ days inside the apparatus in a heroic rescue — justifying NASA’s decision to put scientists in space.

## Shaken Structures

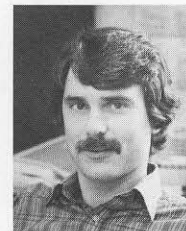
Jim Beck and John Hall, both assistant professors of civil engineering, visited Mexico City 12 days after the September 19 earthquake. Although they couldn’t get into all the structures simply by donning hard hats and trying to appear official, their four days of observations provide some interesting insights into why buildings failed. These are described in “Engineering Features of the Recent Mexican Earthquake,” which starts on page 2. Unofficial though their investigations were, they may be of particular importance since few official engineering studies were done in the rush to clear away the ruins. And the structural failures in Mexico City will force a closer look at other areas that may have similar soil characteristics.

Hall received his BS from West Virginia University (1972),



MS from the University of Illinois (1973) and PhD from UC Berkeley (1980). He’s been at Caltech since 1980.

Beck’s PhD is from Caltech (1978), and he returned here to



join the faculty in 1981. His BSc and MSc (1970) are from the University of Auckland in New Zealand.

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