

## Editorial

### *This is our universe*

An extraordinary astronomical event occurred at a most appropriate moment. Right in the midst of events commemorating the 25th anniversary of mankind's "giant leap" onto the Moon, a shower of comet fragments landed on the planet Jupiter. What amazing pictures we all saw, including those released on July 19, showing a fireball as big as the Earth protruding briefly from Jupiter's surface.

Too often today we are told that we can no longer afford to spend the money to explore space—even the great achievements of the Apollo program are downplayed. It is argued that we do not need men in space, that we should only have unmanned flights or unmanned observatories.

But the comet hitting Jupiter gives us a useful opportunity to argue exactly the opposite: Let's not count-erpose the two; let us instead commit ourselves anew to an all-out, multi-faceted approach to conquering the frontiers of space. This was the vision which inspired all of those who worked to make the Apollo program such a stunning success, and it is the vision of the scientists and engineers who dedicated their lives in some way to exploring the heavens.

According to a recent poll, 56% of Americans believe that the United States should participate in a manned mission to Mars. Space, after all, is the modern frontier, and being able to witness (through telescopes) the recent marvelous occurrence on Jupiter reawakened a kind of excitement and enthusiasm about the possibilities of exploring the secrets of the universe that is now unfortunately too often missing from our lives.

The collisions of fragments of Comet Shoemaker-Levy 9 were probably the most important astronomical event witnessed in the 400 years since the discovery of the telescope, and we were privileged to be able to witness it, virtually as it was occurring. The Hubble Space Telescope, because it orbits the Earth every 96 minutes, can see Jupiter for a substantial part of every 48-minute "night", 15 times each day. Now we see how useful it is to have Hubble, a program which suffered heavy attacks. Another instrument that has such

an advantage is the Galileo spacecraft, which is now much closer to Jupiter than we are—149 million miles. It alone has been able to see the impacts as they occur on the far side of the planet. It will take some weeks to transmit its images.

The nice thing about the events on Jupiter was that they were a surprise. The collisions of the comet fragments caused large releases of radiant energy, and the spectra obtained by astronomers can in time be analyzed to reveal more about the composition of Jupiter—and of the comet. Even in these earliest days after the events, scientists see evidence that Jupiter's stratosphere contains elemental sulfur and hydrogen sulfide. These were already suspected, the sulfur in connection with the pale yellow seen on the planet. Second, much more acetylene and ethane were detected than originally discovered by the Voyager flybys in 1979. Ethane, found in natural gas, and acetylene are among the hydrocarbons found in small amounts in the outermost layer. The dominant hydrocarbon there is methane (swamp gas). The vast bulk of Jupiter, however, is hydrogen (82%) and helium (17%), close to the solar proportions.

Since Jupiter is a gaseous planet, much of what we learn about it can be compared directly with observations of the Sun. Already there is evidence of at least two possible acoustic waves on the surface of Jupiter, which would be similar to such waves on the Sun. Astronomers describe the Sun as "ringing like a bell," at thousands of different frequencies which they can identify.

What information we gain from this event will be supplemented and correlated when, on Dec. 7, 1995, a probe from the Galileo craft will descend into Jupiter's atmosphere and radio detailed information to us.

If nothing else, the space program is important because it lifts our vision out of the mud of daily existence, and helps us to contemplate the wonders of God's universe which we have as yet so barely penetrated. And so we celebrate John F. Kennedy's remarkable vision with an excitement that reminds us of that great day when man first set foot on the Moon.