

## 07.07

### Where On The Moon?

#### *Satellite Applications*

From the time that Galileo Galilei trained his telescope at the Moon 378 years ago, its features became the object of study and speculation. Galileo was the first to liken the lunar surface to that of the Earth. The rugged cratered highlands he called terrae or continents; and the flat, dark areas he named maria or seas.

Since then a debate has ensued about our closest neighbor in the sky and Earth's only natural satellite. The Moon's origin became a topic of some significance to the understanding of our own planet. Thus, whether the Moon's craters were of volcanic origin or scars of ancient impacts became a scientific issue.

The pace of investigation and the emotions associated with the various lunar theories were heightened when the United States selected "putting a man on the Moon and returning him safely back to Earth" as the objective of its space program.

If astronauts were to land safely on the Moon then we must advance our knowledge of the lunar surface. The unmanned Ranger, Lunar Orbiter and Surveyor programs returned the necessary data in preparation for the manned Apollo program.

The most significant question that was posed at the time was, where do the astronauts land? The criteria were simple. The sites must be easy to reach and safe for landing; they must be flat and lack any blockiness that might jeopardize the safety of the landing craft and that of the astronauts. Apart from these "engineering" requirements, there were the "scientific" ones. These dictated that the sites must be interesting -- their

investigation should answer specific questions concerning the origin of the Moon and/or the evolution of its surface features.

Following these basic criteria were others relating to the amount of payload to be delivered at a given site, the capabilities of the scientific instruments to be used, and the plans for future exploration of the Moon during the Apollo program and beyond.

Six lunar sites were selected on the near side of the Moon through the recommendations of NASA's Group for Lunar Exploration Planning including: southwestern Mare Tranquillitatis (Apollo 11), a strip of Oceanus Procellarum (Apollo 12), the Fra Mauro Formation (Apollo 13/14), eastern Mar Imbrium (Apollo 15), the highlands north of the crater Descartes (Apollo 16), and southeastern Mare Serenitatis (Apollo 17).

This lecture will explain the process of lunar landing site selection. It will review the arguments, pros and cons for the various sites and methodologies. It should serve as the basis for the process of selection of a site for the lunar base project.