



The Mercury MESSENGER



Issue 1

The newsletter concerned with exploration of the planet Mercury

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Mercury Comes of Age

Why has a resurgence of interest in Mercury occurred in the last few years? The consensus was, after the Mariner 10 encounter of the planet more than a decade ago, that Mercury, which appeared to be a subdued version of the Moon, was "the boring planet." Many of those who study Mercury now are referring to this planet as elusive or enigmatic because of the intriguing nature of some of the formerly and recently obtained observations of the body. Such measurements can be difficult to acquire and, when acquired, difficult to interpret.

In fact, the innermost planet has become an increasingly important target of scientific interest for the following reasons:

1. During the last decade, a growing body of significant results has been achieved from analysis of the wide range of ground-based data acquired for Mercury. These results include the discovery of an atmosphere by means of visual and near-visual observations, and the imaging/profiling of the imaged and unimaged (by Mariner 10) hemisphere by means of ground-based radar observations.

2. Recent in-depth study of the existing Mariner 10 database, a decade after it was acquired, has led to extensive reevaluation of the proposed models for the evolution of Mercury's surface.

3. Major technological barriers, which had prevented any serious consideration of a Mercury orbiter in the past, have been essentially eliminated due to (a) advances in thermal shielding capabilities, and (b) the discovery of new ballistic launch trajectories for a near-polar orbiter of reasonable size that could use existing launch capabilities (see "From Here to Mercury" by Chen Wan Yen in this issue).

4. In 1986, two prominent science agencies recognized the need for a Mercury orbiter: the National Academy of Science Space Science Advisory Board recommended that high priority be given to a Mercury orbital mission due to the

broad spectrum of scientific interest for that target, and the European Space Agency proposed a Mercury orbiter as a primary candidate for a future mission.

5. The recognition that we have a dearth of information about Mercury, information that is crucial for the resolution of recently raised issues on the origin of the solar system, is becoming widespread. Data on Mercury, which is viewed as an endmember in most models because of its position as the innermost planet, is crucial in resolving these issues.

6. Interest in and recognition of the ongoing Mercury work, which is occurring across a wide range of disciplines, increased substantially after the Mercury Meeting that was held last year. This meeting resulted in greatly increased efforts to coordinate Mercury research activity and generate awareness of this activity in the planetary science community.

"Mercury, that planet which has seemed a rather boring lunar analog for so long, has recently shown itself to be, on the contrary, intriguingly elusive."

Our logo is a symbol for Mercury, "the messenger," which originated among the Quiche Maya people who still live in the highlands of Guatemala. Such Mayan messenger symbols, which correspond to the planet Mercury, appear as owls. The particular symbol used in the logo, Skull Owl, was suggested by Andrew Potter. Dr. Potter describes Skull Owl as "a rather cheerful and alert fellow, gritting his teeth to overcome difficulties encountered as the lowest ranking messenger. He might be a fitting symbol for the present-day Mercury researcher, who faces many difficulties but remains optimistic." Dr. Potter will provide a more detailed explanation of the origin of the Mayan Mercury in the next newsletter.

Mercury: The Elusive, Enigmatic, and/or Endmember Planet

The first meeting in over a decade devoted to study of the planet Mercury was held less than a year ago. The meeting was cosponsored by the International Astronomical Union and the AAS Division of Planetary Scientists, and was co-chaired by Clark Chapman and Faith Vilas. Over 100 scientists from a wide range of disciplines were registered for the international conference that was held during the height of summer in Tucson, Arizona (the environment being kind of a Mercury analog, but hospitable nevertheless). Topics were intensely discussed by this interdisciplinary group, and future cross-discipline collaborative activity was planned. The highlights of the meeting were as follows:

1. Models for the temporally varying structure of the recently discovered Na and K atmosphere of Mercury were presented, and implications for the origin of this atmosphere and predictions for other elements that might be present were discussed.

2. Further constraints were placed on interior structure and composition, and on the origin of the planet. A consensus was reached on the need to send an orbital mission to Mercury to obtain geochemical information so that major questions on the origin of Mercury and the other terrestrial planets can be resolved.

3. The magnetosphere and solar wind/surface interactions have been further characterized. Again, the need for an orbital mission to provide further data in this area was discussed.

4. Analysis of geologically related data available for Mercury provided further indications that the plains are volcanic in origin and that structural and albedo features are related to global-scale tectonics. Structural and terrane mapping of Mercury's surface has yet to be completed.

5. In the part of the hemisphere unimaged by Mariner 10 that has been