

NEWLY DISCOVERED MARTIAN IMPACT BASINS; Marianne Stam, Department of Geology and Geography, University of Massachusetts, Amherst, MA 01003

Three previously unrecognized martian impact basins have been discovered through detailed mapping of landforms, structures and terranes near Cassini and Al Qahira basins. These include Al Qahira A (183.5W,13.2S), Al Qahira B (181.3W,26S) and Cassini A (323.7W,13.7N) (Fig.1).

Al Qahira A lies on the martian dichotomy boundary and intersects the older basin, Al Qahira. It has four rings that are expressed by a variety of landforms (Table 1). The three inner rings are expressed by massifs, knobs and both inward- and outward-facing scarps. The outermost ring is inferred from the concentric distributions of wrinkle ridges, outward-facing scarps and flat-topped massifs. Other evidence that supports the existence of these rings includes an abrupt change in the orientation of Ma'adim Vallis where the first and second rings are crossed. Furthermore, the northern tip of this channel follows a concentric path along the first ring; and an unnamed 'intermediate channel' (1) is found at the intersection between this basin's fourth ring and Al Qahira's outermost ring. Southwestward, Al Qahira A is cut by a younger Basin, Al Qahira B.

Al Qahira B is a highly degraded basin with one identifiable ring (Table 1). Its ring is expressed by a few massifs, knobs and inward-facing scarps, but is recognized mainly by the distributions of wrinkle ridges and plains units. Further evidence for the existence of this ring is a change in orientation of Ma'adim Vallis approximately where the channel crosses it. Southward, Al Qahira B is intersected by basin number nine on Table 2 of Schultz et al. (2).

Cassini A lies southward of the younger Cassini Basin and is intersected by it. It probably has four rings (Table 1), but the second ring is so poorly expressed that its existence must be considered tentative. The first ring is the most prominent and consists of inward-facing scarps, ridges and a few massifs and knobs. The outer rings, in contrast, are expressed by the distributions of furrowed terrane and the approximately concentric orientations of narrow valley networks. Furthermore, a large 'longitudinal channel' (1) to the south abruptly changes orientation from an east-west to a north-south direction where it crosses the fourth ring. This same channel follows an approximately concentric orientation along the third ring.

These findings demonstrate the importance of detailed mapping of various types of landforms and terranes to the discovery of basins on Mars and suggests that there are probably more that await identification.

References Cited

- Baker, V.R., 1982, The Channels of Mars. University of Texas Press, Austin.
 Schultz, P.H., 1982, Jour. Geophys. Res., 87, 9803-9820.

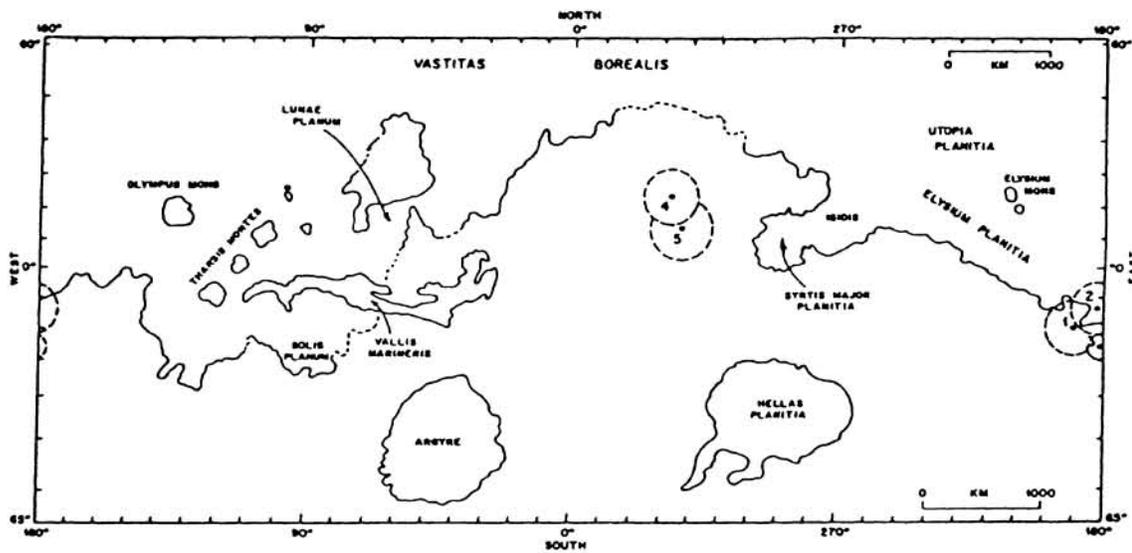


Fig. 1: Locations of new basins. Only outermost rings are shown.

1 = Al Qahira, 2 = Al Qahira A, 3 = Al Qahira B,
 4 = Cassini, 5 = Cassini A.

TABLE 1: Basin Features

<u>Basin Name</u>	<u>Location</u>	<u>Ring Number</u>	<u>Ring Diameters (Km)</u>
Al Qahira A	183.5W,13.2S	1	335
		2	530
		3	731
		4	994
Al Qahira B	181.3W,26S	1	545
Cassini A	323.7W,13.7N	1	354
		2(?)	653
		3	928
		4	1204