CRATER COUNT CHRONOLOGY AND TIMING OF RIDGED PLAINS EMPLACEMENT AT SCHIAPARELLI BASIN, MARS. S. J. Jaret[1] and E. F. Albin[1, 2], [1]Department of Space Sciences, Fernbank Science Center, Atlanta, GA 30307, [2]Department of Physics and Astronomy, Agnes Scott College, Decatur, GA 30030 (ealbin@agnesscott.edu).

Introduction: Found in the eastern portion of the Terra Meridiani region of Mars is Schiaparelli, a 470-km diameter impact structure. Our investigation seeks to compare the age of ridged plains material, interpreted as volcanic lava flows, within and adjacently exterior to the basin rim. Impact cratering statistics were utilized in order to formulate the relative geologic age and thus, the timing for the emplacement of various ridged plains map units. From a volcanological perspective, martian basins, such as Schiaparelli, are of significance for two reasons: 1) large impact basins produce a tectonic array that serves as conduits for subsequent volcanism; and 2) basins are sites of plutonic features that may be associated with rich hydrothermal ore deposits.

Ridged Plains Material: Distributed within and exterior to the rim of Schiaparelli basin are ridged plains units (Figure 1). Collectively, they cover surface areas adjacent to the basin and are thus a significant unit in terms of aerial distribution. Ridged plains materials are morphologically characterized as having a smooth topography with wrinkle ridges scattered across them. These units have been previously suggested to be areas covered by basaltic lava flows [e.g., 1]. The occurrence of wrinkle ridges, flow lobes, and possible igneous plutonic features support a volcanic interpretation for their origin.

Crater Count Chronology: Various ridged plains units associated with Schiaparelli were dated (Figure 2), in a relative fashion, by using crater count statistics. These units were dated by this crater size-frequency technique. Impact craters greater than two kilometers in diameter were counted across six areas, normalized to one million square kilometers, for four exterior and two interior ridged plains units. Craters were grouped accordingly: 2.0 – 4.0 km, 4.1 – 6.0 km, 6.1 – 8.0 km, 8.1 – 12.0 km, 12.1 – 16.0 km, 16.1 – 24.0 km, 24.1 – 32.0 km, 32.1 – 48.0 km, 48.1 – 64.0 km, and 64.1 – 96.0 km. A summary graphical representation of our results is given in Figure 3. Although there appears to be some spread in age distribution, it is suggested that interior ridged plains are younger than exterior units, reflecting a complex history of intense volcanism after the impact event.

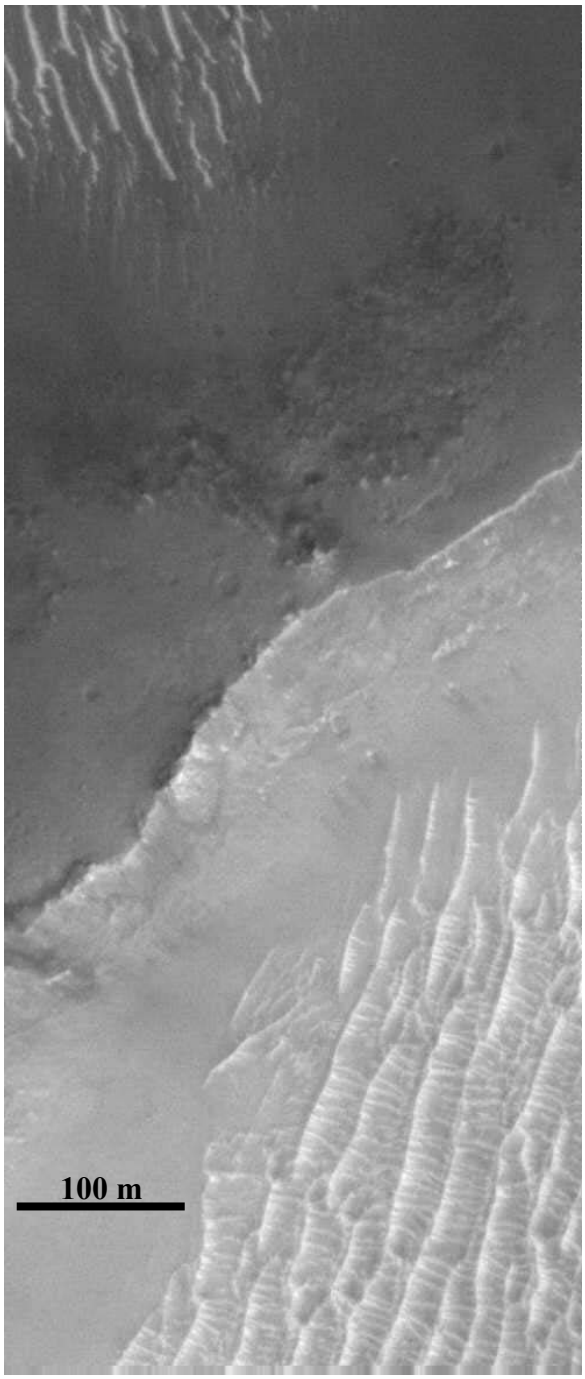

Figure 1: High resolution section of ridged plains material associated with Schiaparelli basin. Note presence of wrinkle ridge suggesting volcanic origin (MOC frame # 0100182).

References:

[1] Saunders R. S., Bills T. G. and Johanson L. (1981) *LPSC,12,* 924–925.

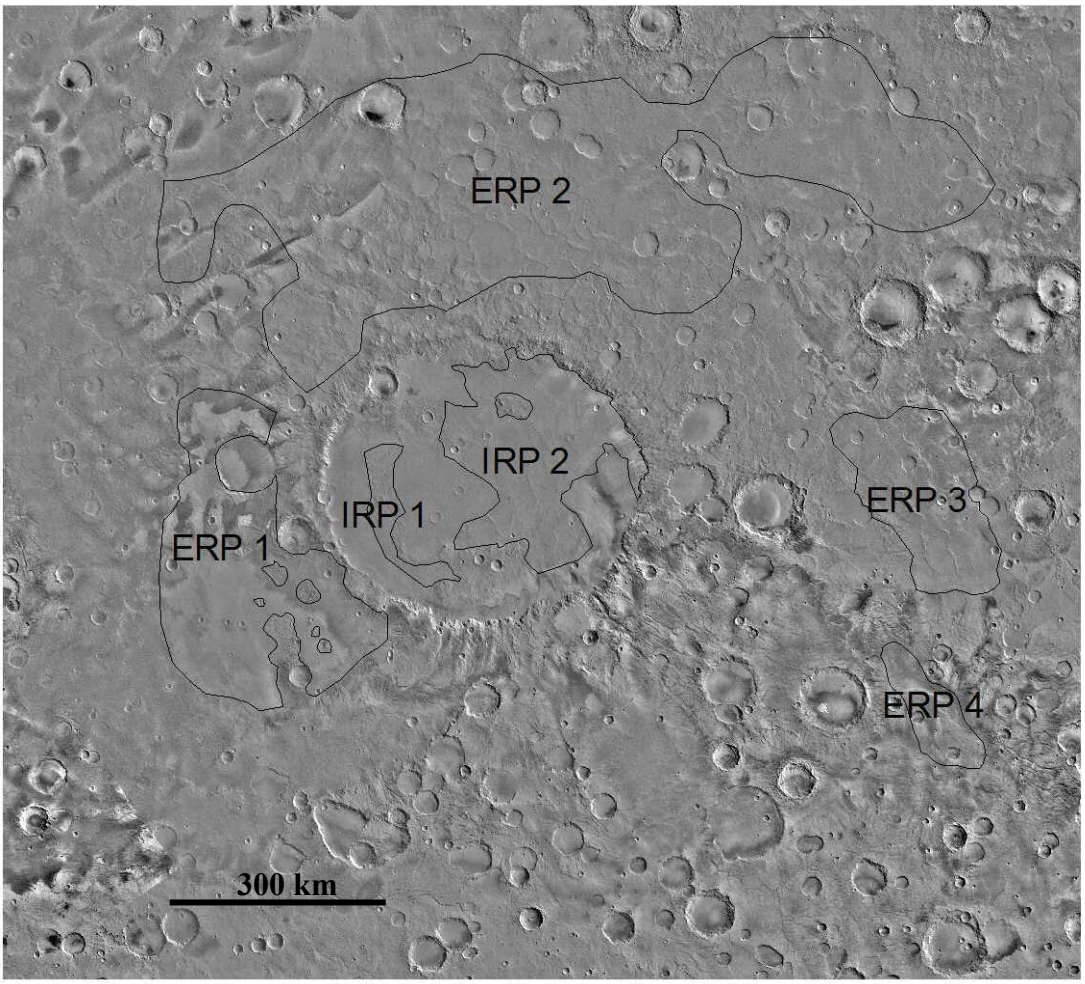

Figure 2. Photomosaic with crater count areas indicated, where ERP = exterior ridges plains and IRP = interior ridged plains.

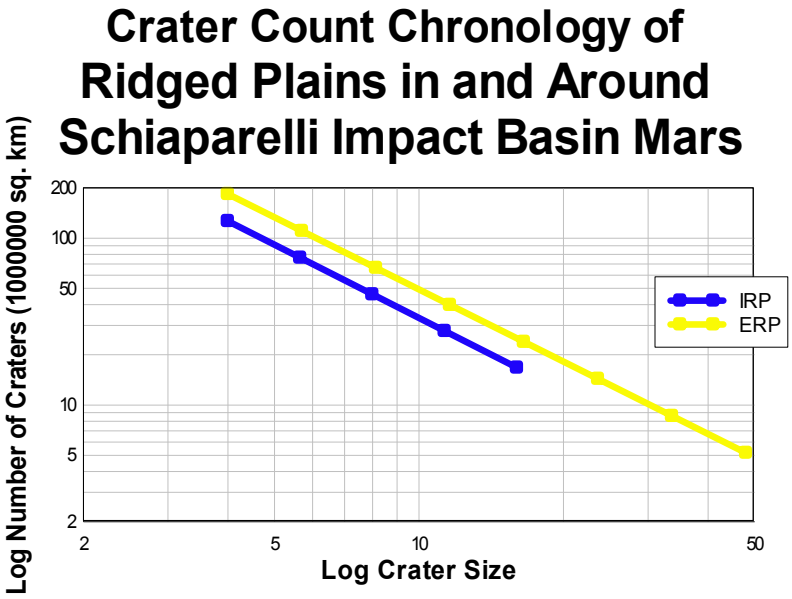

Figure 3. Crater count chronology summary for Schiaparelli basin interior / exterior ridged plains units.