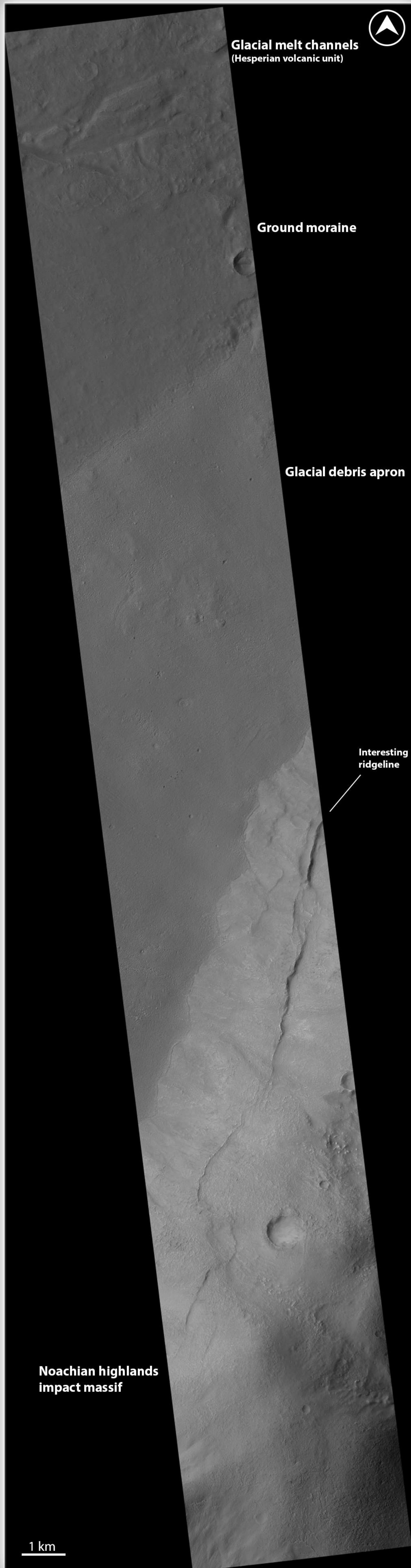


HiRISE image ESP_046587_1435
Mesopotamia Human Exploration Zone



New HiRISE observations from two candidate human exploration zones on Mars: Mesopotamia & Protonilus Mensae.

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Mesopotamia

The Mesopotamia candidate human exploration zone is located in the southern hemisphere of Mars on the eastern rim of the Hellas impact basin. This area is known for large volcanic flows, vast fluvial channels, and abundant glacial landforms.

HiRISE image ESP_046587_1435 (centered at -36.278° , 94.934° East) is a newly acquired data set from Mars displaying a remarkable sequence of Martian geology and chronology. The image is captured from an altitude of 255.8 km and with a resolution of 50 cm/pixel.

At the southern end of the image is a high elevation, Noachian highlands impact massif uplifted by the Hellas impact. This massif has been smoothed by glacial processes and contains an interesting ridgeline. Progressing north and lower in elevation, a distinct glacial debris apron with tartan flow patterns can be seen draping the massif. Below this is a ground moraine associated with the debris apron. To the north of this moraine are glacial melt channels carved into Hesperian volcanic flows. These channels were most active when the debris apron spanned the area of the ground moraine.

These features make the Mesopotamia exploration zone a prime candidate for future human missions, both in terms of science and in-situ resource utilization value.

Special thanks to the Mars Human Exploration Zone working group and the HiRISE mission.

Figure 1a. Global context image. Figure 1b outlined in RED.

Figure 1b. Regional context image of east Hellas rim. Figure 1c outlined in RED.

Figure 1c. Mesopotamia exploration zone outlined white. Figure 1d outlined RED.

Figure 1d. Local area context for HiRISE image ESP_046587_1435.

Protonilus Mensae

The Protonilus Mensae candidate human exploration zone is located in the northern hemisphere of Mars on the planetary dichotomy. This area is a complex, fretted network of mesas and valleys known for its abundant glacial landforms.

HiRISE image ESP_045428_2225 (centered at 42.012° , 47.681° East) is a newly acquired data set from Mars displaying intricate patterns indicative of past (and possibly current) liquid and solid water flow. The image is captured from an altitude of 297.6 km, and has a resolution of 50 cm/pixel.

This image spans the width of a ~31 km diameter impact crater. The southern edge is marked by one rim of the crater, which then descends into a short sequence of glacial brain terrain. To the north, the brain terrain gives way to a sequence of layered crater fill deposits as well as chaotic terrain with cirque-like landforms. Continuing north, sequences of lineated brain terrain are observed with parallel and chevron flow patterns. The northern end of the image is marked by the opposite crater rim, incised by inflow channels which once brought water and sediment into the crater.

These features make the Protonilus Mensae exploration zone a prime candidate for future human missions, both in terms of science and in-situ resource utilization value.

Special thanks to the Mars Human Exploration Zone working group and the HiRISE mission.

Figure 2a. Global context image. Figure 2b outlined in RED.

Figure 2b. Regional context image of Protonilus Mensae. Figure 2c outlined in RED.

Figure 2c. Protonilus Mensae exploration zone outlined white. Figure 2d outlined RED.

Figure 2d. Local area context for HiRISE image ESP_045428_2225.

HiRISE image ESP_045428_2225
Protonilus Mensae Human Exploration Zone

