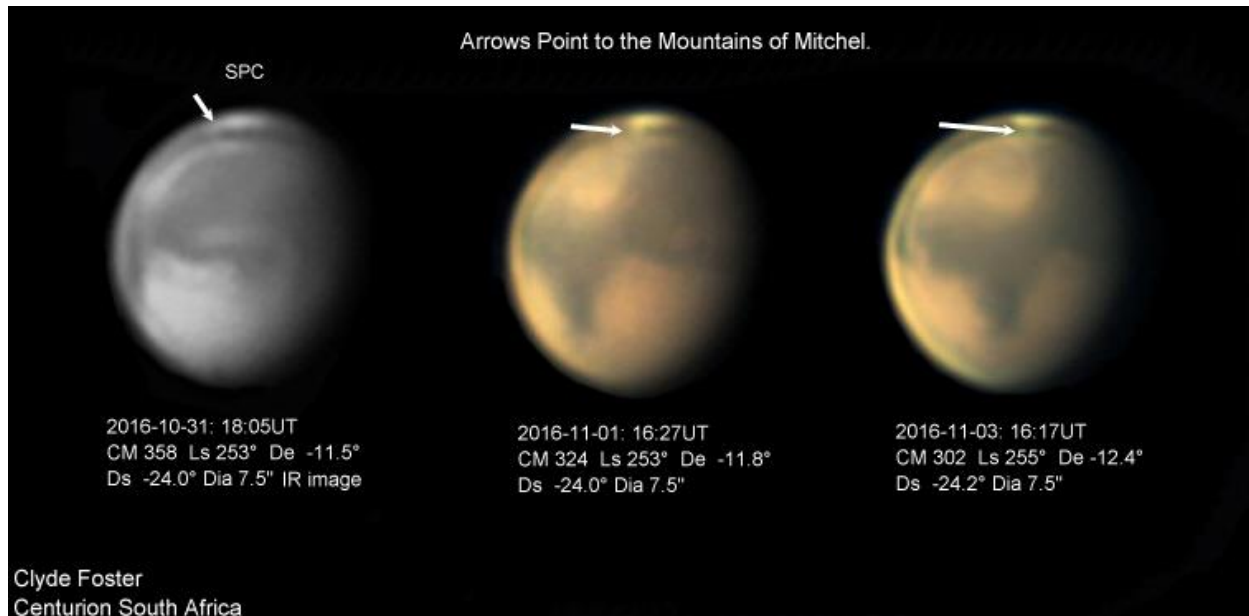


# Highlights of the 2015-2017 Mars Apparition

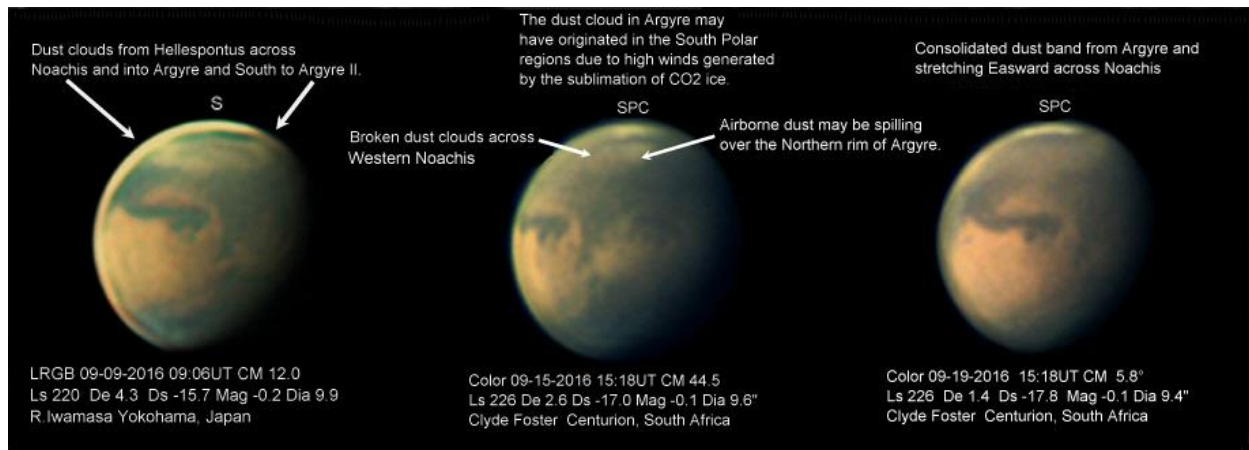
By Jim Melka

## Mountains of Mitchel Captured from Ls 253 to Ls 255



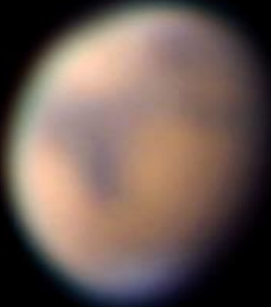
## Hellas-to-Argyre Dust Clouds

The images below are from September. In my opinion, these clouds are produced by winds from the continuing sublimation of the CO<sub>2</sub> ice cap.



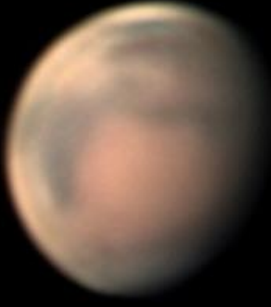
# Dust Storm Alert

Dust Clouds over Hadriacum, Hellas and Yaonis Regio



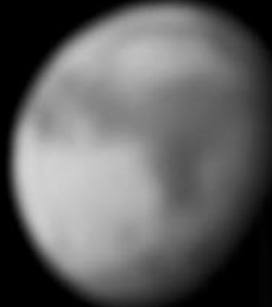
Sep.03-01:20UT CM 316.4  
Jim Melka - Discovery Image

Dust Clouds expand Westward over Pandora's Fretum



Sep.04-03:05UT CM 332.3°  
Ethan Chappel

Dust Clouds expand over Ausonia and Northern Tyrrhenum



Sep.05UT-00:39 CM 287°  
Michael Hood

Thin dust clouds over NW Mare Tyrrhenum and Iapygia Viridus



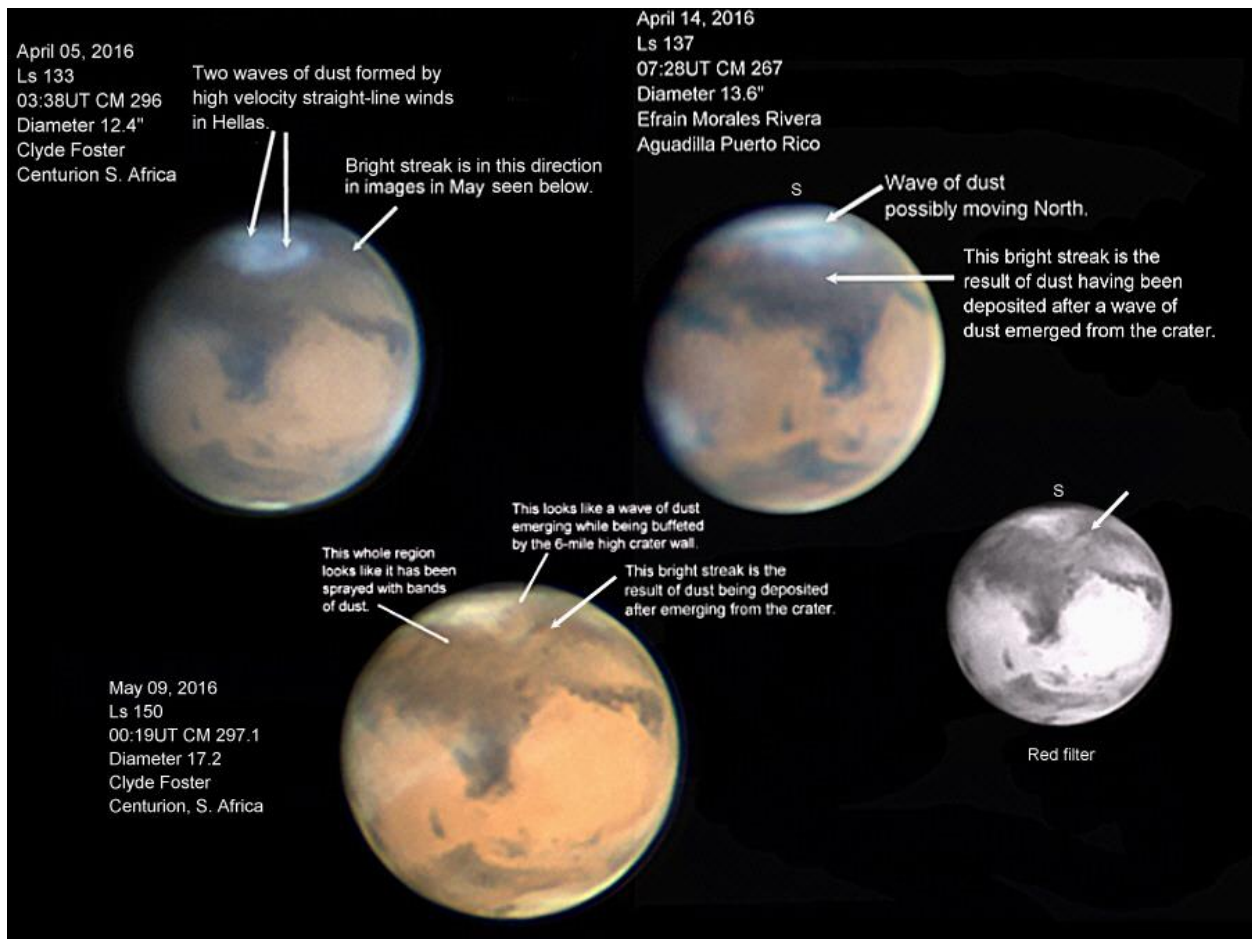
Sep.06UT-01:52 CM 295  
Jim Melka

Other Data: Ls ~217° De 5.5° Ds -14.8° Dia 10.1" Mag -0.2 Phase 0.85

Report by Jim Melka

## Hellas Basin

The images below from April 5th to May 9th provide evidence for strong South to North straight-line winds in the Hellas basin from Ls 130 to Ls 150. This period is the middle of winter in the Southern Hemisphere. I propose that the sublimation of CO<sub>2</sub> ice produces straight-line winds. With the ice exposed to sunlight, the frozen CO<sub>2</sub> [sublimates](#), creating enormous winds up to 400 km/h.<sup>[2]</sup> Each southern winter, the seasonal CO<sub>2</sub> ice cap covers the surface to a latitude of 50°.<sup>[28]</sup> This means that the Northern edge of the cap bisects Hellas. See Christopher Go's and Anthony Wesley's March images below the April and May images. The grey-colored CO<sub>2</sub> cap covers the Southern one-fourth of Hellas. It can be deduced that sublimation winds here contribute to the waves of dust in Hellas. Hellas is immense with the South to North diameter about 1,300 miles that is roughly the distance from the US-Canada border to the panhandle of Texas. So, with that diameter, a significant temperature gradient is likely in the South to North direction that can continue the strong sublimation winds that carry immense waves of dust from South polar regions to the Northern wall of Hellas. These detailed images by Clyde Foster and Efrain Riveras Morales show what I think are the results of these winds. References are courtesy of Wikipedia.

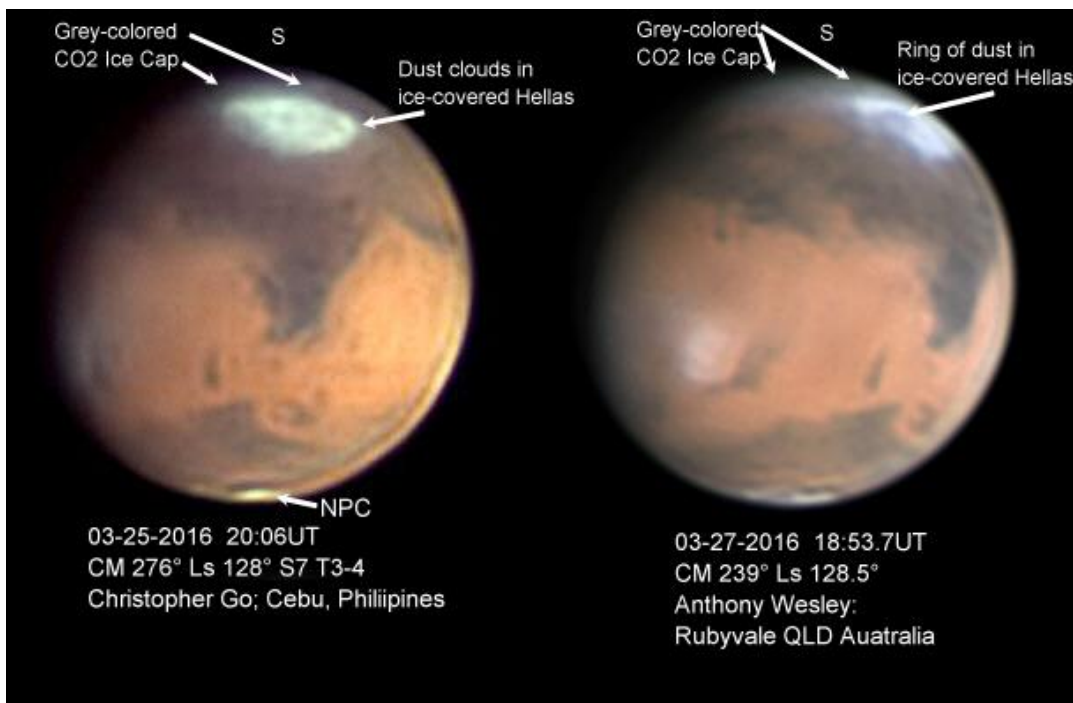


Also note that the floor of Hellas is blue in the April images and white in the May 9th image. A blue color can mean the presence of H<sub>2</sub>O water vapor but what would be its source? Temperatures in the

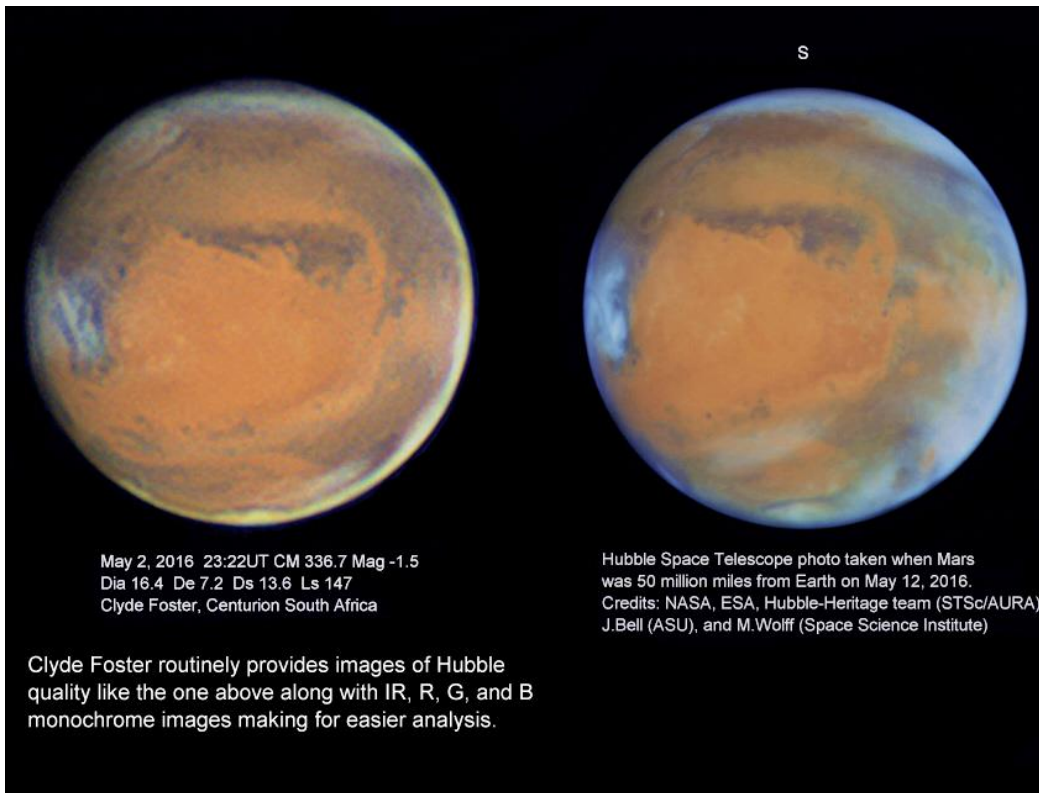
South polar regions are warm enough for CO<sub>2</sub> sublimation but not H<sub>2</sub>O sublimation. However, the North polar cap of Mars does get warm enough for H<sub>2</sub>O sublimation. Maybe this is a source of the water vapor. See page 399 of a Traveler's Guide to Mars by William K. Hartmann published 2003.

First recorded images in this apparition of Wind-Blown Dust Clouds in Hellas. Also, the Northern extremes of the SPC are visible and are grey colored. I don't remember ever seeing the CO<sub>2</sub> part of the SPC in amateur images! Pardon me for saying "Wow!"

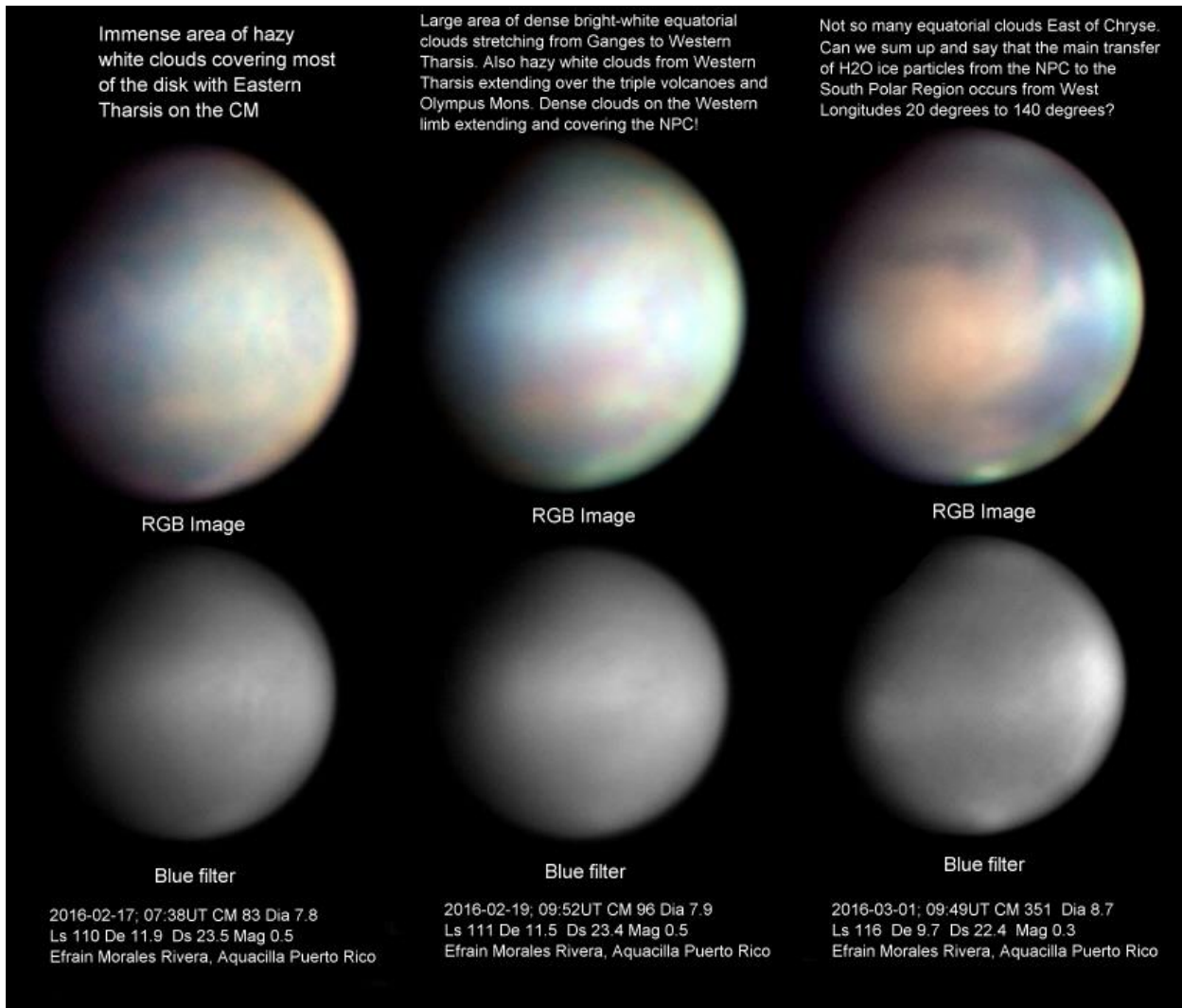
See images below. About one-fourth of Southern Hellas is covered by the seasonal cap.



Many small features distinguishable on Clyde Foster's image below!



Images from Feb 17, 2016, to Mar 1, 2016. Have you ever seen such a broad expanse of white clouds over the Martian disk?

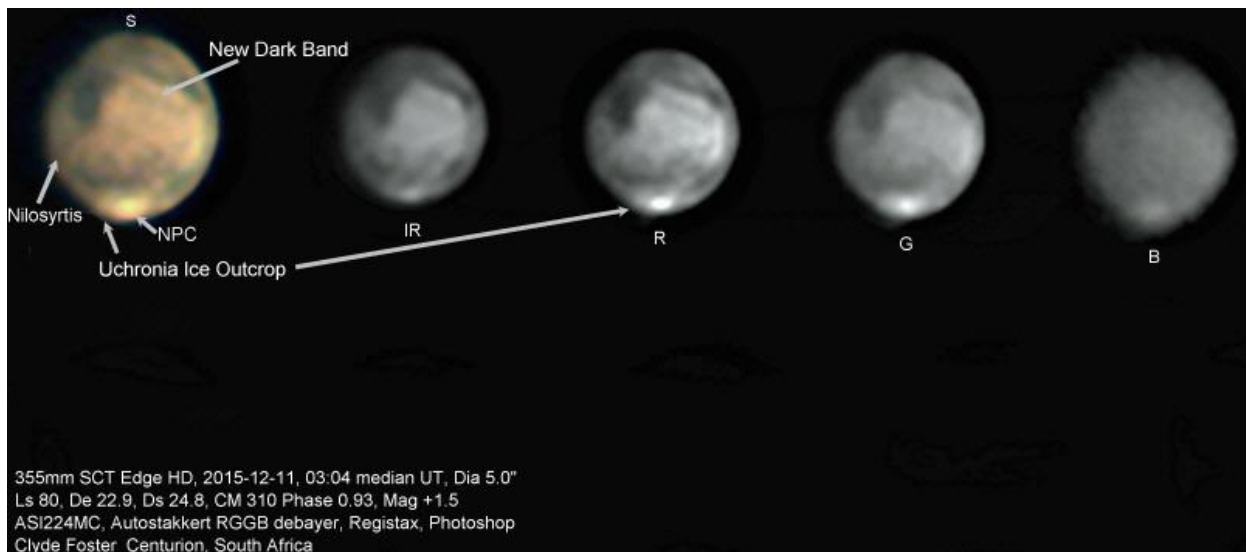


## Images from February 7<sup>th</sup>, 8<sup>th</sup>, and 12<sup>th</sup> 2016



These images show heavy concentrations of H<sub>2</sub>O clouds in the equatorial regions of Mars. The gaseous clouds sublime from the granular North Polar Cap and move Southward higher and higher in the atmosphere. To the right (West) of the CM orographic clouds are visible over 3 of the Tharsis volcanoes. To the East of the CM, Acidalia planitia and Chryse planitia are like deep valleys in the Northern hemisphere where possibly an orographic type of action produces equatorial H<sub>2</sub>O clouds. But, it may be some other mechanism. Also interesting, the green and blue images show bright areas indicating low altitude fogs and clouds above that. Further, the February 7<sup>th</sup> and 8<sup>th</sup> red images show the same bright areas that suggest ground frost.

## Images from December 11<sup>th</sup> 2015



The dark markings are sharp and very detailed with Mars only 5" in diameter on 12-11-2015. A standout marking is Nilosyrtris that had mostly vanished in the last 5 apparitions. A noticeable change is a new prominent dark band under Sabaeus Sinus. It is late Spring in the Northern Hemisphere. During Spring the North Polar Cap shrinks unevenly leaving ice outcrops such as the one shown here in Uchronia.