Titan's Shadow

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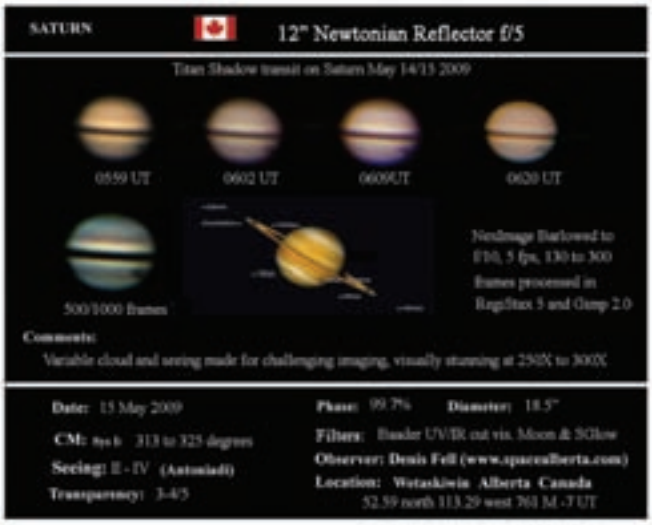
As I said in my last column, I've always managed to keep astronomy fresh by finding new challenges. Here is a recent example.

On Friday morning, 2009 May 15, I observed what was for me a lifetime first: the shadow of Saturn's biggest moon, Titan, in transit across the face of Saturn. Because Saturn's equatorial plane is currently almost perfectly aligned with the Sun, there are now satellite "phenomena" occurring, similar to those that occur all the time with Jupiter's moons. Because of Saturn's much greater distance from the Earth and the small size of most of Saturn's moons, only the transits of Titan's shadow are visible. These occur every two weeks plus two days, as Titan's orbital period is 15.945 days. Details can be found at `www.skyandtelescope.com/observing/highlights/42917562.html`

This transit was predicted to begin at 5:26 UT (1:26 a.m. EDT). Having observed many shadow transits on Jupiter, I knew that I wouldn't be able to detect the shadow until sometime after first contact. To be safe, I started observing at 01:00, using an Orion 180-mm f/15 Maksutov-Cassegrain, which I'm currently testing. I used a Tele Vue Nagler 11-mm eyepiece yielding 245×. Saturn had its familiar 2009 appearance of a cocktail onion impaled on a toothpick. Titan's disk was visible very close to the junction between the rings and the disk, hard to pick out in the glare from the planet. At this point, Saturn's altitude was only 26°, and it was sinking rapidly toward the western horizon. The seeing, which was poor to start with, deteriorated as Saturn got lower in the sky.

I first detected the shadow of Titan as a notch in the limb of the planet at 1:45 a.m. (05:45 UT). I continued to follow it for the next 15 minutes, until the seeing reached the point where the shadow blended in with the planet's blur. Saturn's altitude was now only 15°, and the chromatic aberration caused by the Earth's atmosphere was strongly evident. Still, I felt lucky to have caught this rare appearance of the three-dimensional pattern of Saturn, Titan, and Titan's shadow.

I posted my observing report on the RASCals email list, and soon heard from Bill Weir in Victoria and Denis Fell in Wetaskiwin, Alberta, who both had also succeeded in observing the shadow transit. The observers out west had the advantage of Saturn being higher in the sky, but seeing was poor for both of them as well. Despite the poor seeing, Denis succeeded in imaging the transit with his 12-inch Newtonian.



As a strictly visual observer, I'm always delighted to have a photographic record of something I have observed, so I thank Denis for allowing me to use his beautiful images here.

Geoff Gaherty recently received the Toronto Centre's Ostrander-Ramsay Award for excellence in writing, specifically for his JRASC *column,* Through My Eyepiece. *Despite cold in the winter and mosquitoes in the summer, he still manages to pursue a variety of observations, particularly of Jupiter and variable stars. Besides this column, he writes regularly for the* Starry Night Times *and the* Orion Sky Times. *He recently started writing a weekly column on the* Space.com *Web site.*