JunoCam at Perijove-PJ17 (2018 Dec.21): Part II. Polar regions

John Rogers (2019 Feb.8)

North polar region

Circumpolar cyclones (CPCs):
Figure N1 is a composite hi-res map of the polar region showing 3 of the 8 CPCs. They all have their usual morphology, i.e. two of the 'filled' quartet and one (at upper right) which always has disturbed 'filled' morphology although it is one of the 'chaotic' quartet. All 3 show evidence of counter-spiral structure near the centre, esp. the disturbed-filled one. By blinking (images 9 or 10 & 13) it appears that in each case, the central region is more-or-less stationary, in contrast to the anticlockwise circulation of the main disk around it; there does not appear to be actual counter-rotation.

There is a distinct AWO inside the octagon, at L3 ~ 170. There was a similar one at PJ11 and PJ16 [see PJ16 report], but at L3 ~ 270, and given the currents in the octagon, the AWO at PJ17 is probably a different one, never before observed. Poleward of it, the PJ17 map shows reddish cloud lanes which are probably arcs aligned with the retrograde jet that surrounds the central cyclone [Adriani et al., 2018, Nature]. This is a remarkable observation as we have not seen these cloud arcs distinctly since PJ1, when the pole was not so strongly tilted into darkness, but the imaging team now take care to obtain north polar images with best quality in the terminator region.

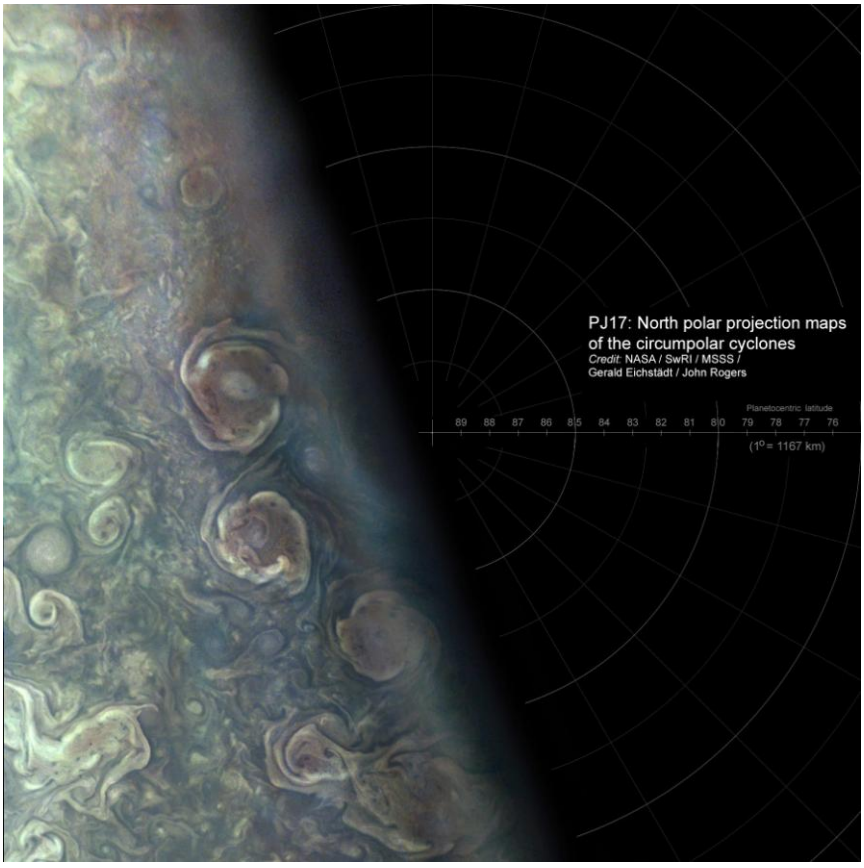

Figure N1

South polar region

Figure S1A is a composite south polar projection map down to 60 deg.S. Features include:

The circumpolar cyclones (CPCs): [Note: CPCs are numbered as in Adriani et al.,(2018, Nature).]
All six CPCs are clearly shown, at least partially, and they are now arranged in an almost perfect pentagon around the central one (Figure S1B). But the (former) gap between CPC-1 and CPC-2 is still distinctive. The images show strange clashes of cloud streamers across gap, and a FFR intruding into it; and one of those small, very dark ovals that we have previously seen only at low resolution, which turns out to be a cyclonic oval embraced by an AWO.
CPC-2 now has a large 'filled core' like the filled quartet at the north pole; this is also methane-bright. This morphology has not previously been seen at the south pole.
The central cyclone had been almost static from PJ13 to PJ16, but has now moved back closer to the pole. In fact it is very close to its position at PJ5 and PJ11; it may have resumed its cyclic motion (Figure S2).

Haze band: There is a very prominent >-shaped rainbow band at terminator (Figure S1A). (It looks very much as though the red side is brown shadow.) It is close to the position that was occupied by the hooked end of the 'long band' at PJ8 & PJ9, suggesting that the 'long band' (which existed from PJ5 to PJ12) may have re-formed now, but unfortunately the relevant longitudes cannot be seen as there are no further PJ17 departure images.

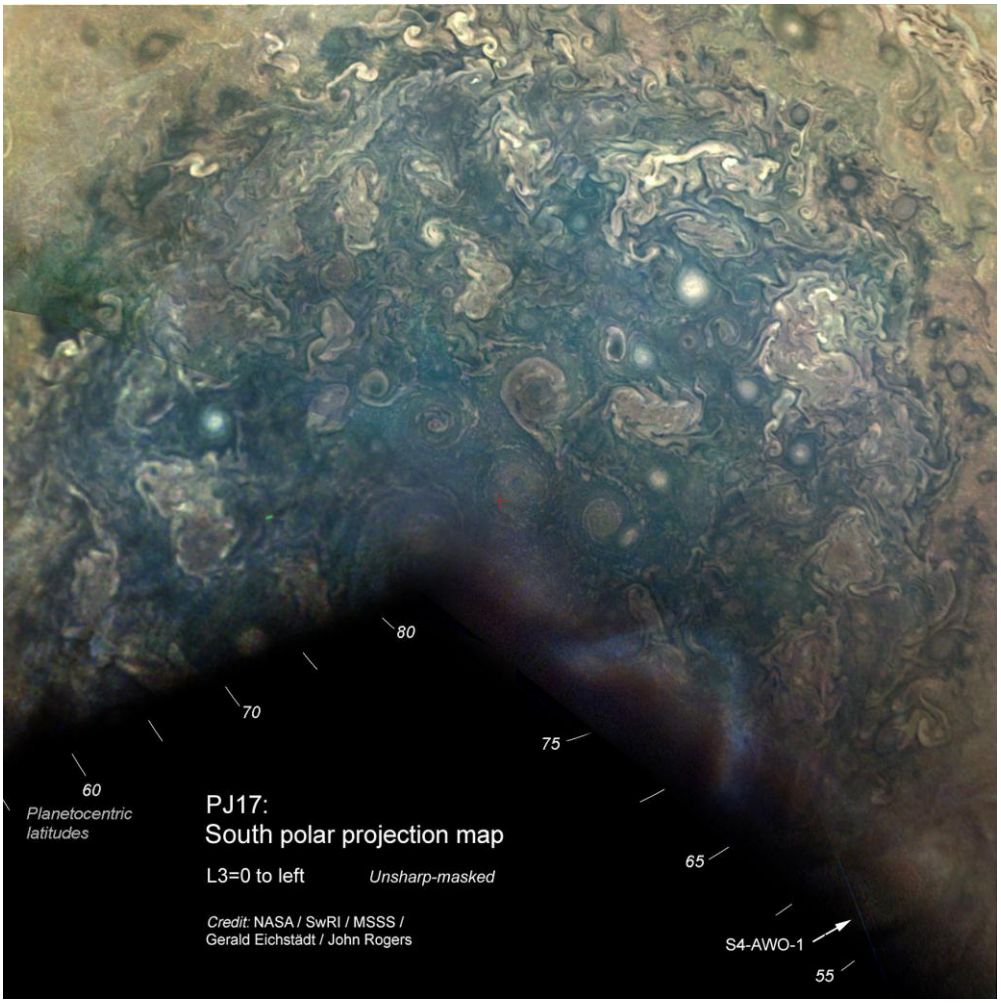

Figure S1A

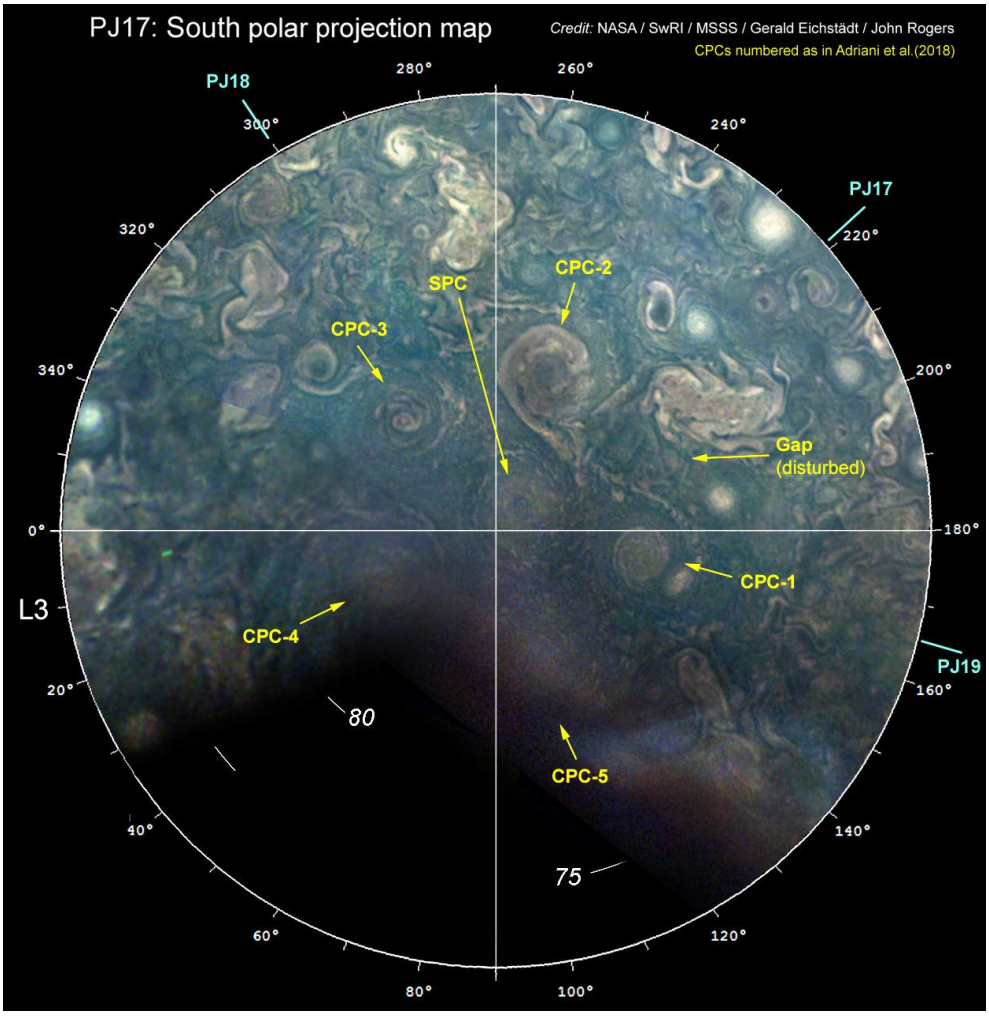

Figure S1B

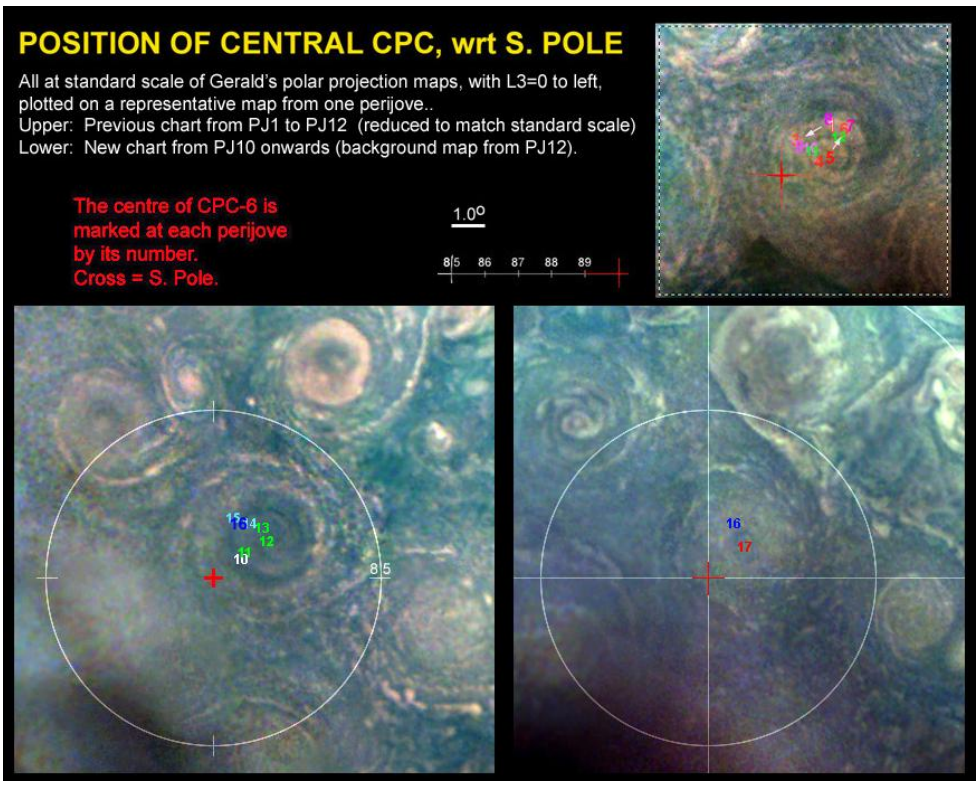

Figure S2