

JunoCam at PJ34: What the pictures show:

Part I. Overview of non-polar regions

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This report is rather delayed and brief, and the report on the polar regions is deferred until later, but the PJ34 images were of the usual high quality. For a splendid overview of PJ34, see the movie recently released by NASA/JPL (by Scott Bolton and colleagues, largely based on Gerald Eichstädt's processing of the images, with music by Vangelis). This 'flyover movie' is here:

<https://www.jpl.nasa.gov/news/ride-with-juno-as-it-flies-past-the-solar-systems-biggest-moon-and-jupiter>
or here:

<https://www.youtube.com/watch?v=CC7OJ7gFLvE>

The Juno mission had been scheduled to end in 2021 July, but with a 4-year extension granted by NASA, the orbit had been adjusted prior to PJ33, so that on June 7, 14 hours before PJ34, Juno would perform a close flyby of Ganymede (1038 km above the surface). This was Juno's first flyby of any of the moons, and it not only produced excellent images of Ganymede itself, but also altered the orbit to reduce the period from 53 days to 43 days. The period will remain at 43-44 days until 2022 Sep., when a close flyby of Europa will reduce it further.

PJ34 thus took place on 2021 June 8. Juno crossed the equator at L1=139, L2=141, L3=305. This was very close to the track at PJ33, so many of the same features were imaged.

Ganymede

Because the flyby was so fast, JunoCam could only take 5 images of Ganymede, from the terminator to the subsolar side. But they covered the whole visible surface, and showed that JunoCam can take sharp hi-res images of the moons even though it was not designed for this. [Figure 1](#) shows the two best images; [Figure 2](#) is a labelled enlargement of a part showing the most interesting features. Individual features have been imaged more closely by the Galileo orbiter, but for some parts of the disk, these are the best images ever taken.

Global maps

[Figure 3](#) is a global map of Jupiter around the time of PJ34, made from ground-based images by Rob Bullen. [Figure 4](#) is the global map from JunoCam images, made by Gerald Eichstädt. For the first time, Gerald has assembled this from the single-image map projections by a new automated technique, which will save us a lot of time in future.

N. Equatorial Belt (NEB)

White Spot Z (WSZ) was beyond the eastern horizon at PJ34, so the images show the large dark reddish-brown area just following it – also seen partially at PJ33. Although this resembles a barge, it is slightly further north ([Figure 3](#)) and is not a well-defined cyclonic circulation ([Figure 5](#)); both this area and the barges are methane-dark in ground-based images at 0.89 μm [not shown here]. The PJ34 closeup ([Figure 5](#)) shows this area to be largely quiescent, but with many bands running N-S, comprising a wavetrain with wavelength $\sim 0.9^\circ$

longitude. Similar wavetrains have been observed several times previously on the NEB, particularly from Hubble images.

Equatorial Zone (EZ)

The orange colour is still strong, and the closeups show the familiar intricate mixture of cloud and wave patterns, beautifully shown in a “fish-eye” rendition of image 66 by Kevin Gill (Figure 6).

S. Temperate domain

This was the region of greatest interest at PJ34, as the images would again span the sector between oval BA and Clyde’s spot (Figure 7). Clyde’s spot (also called DS7) is still a FFR and has grown larger since PJ33 (Figure 8). I expect that this will continue to grow and develop into the next STB structured segment (to be called segment G) – although given the amount of darkening and disturbance now centred on Clyde’s spot, it seems possible that the STB segment will develop from a longer sector of the domain. WS6 (formerly DS6) is still light orange (though bright white in ground-based images).

On following pages:

Figures (reduced scale)

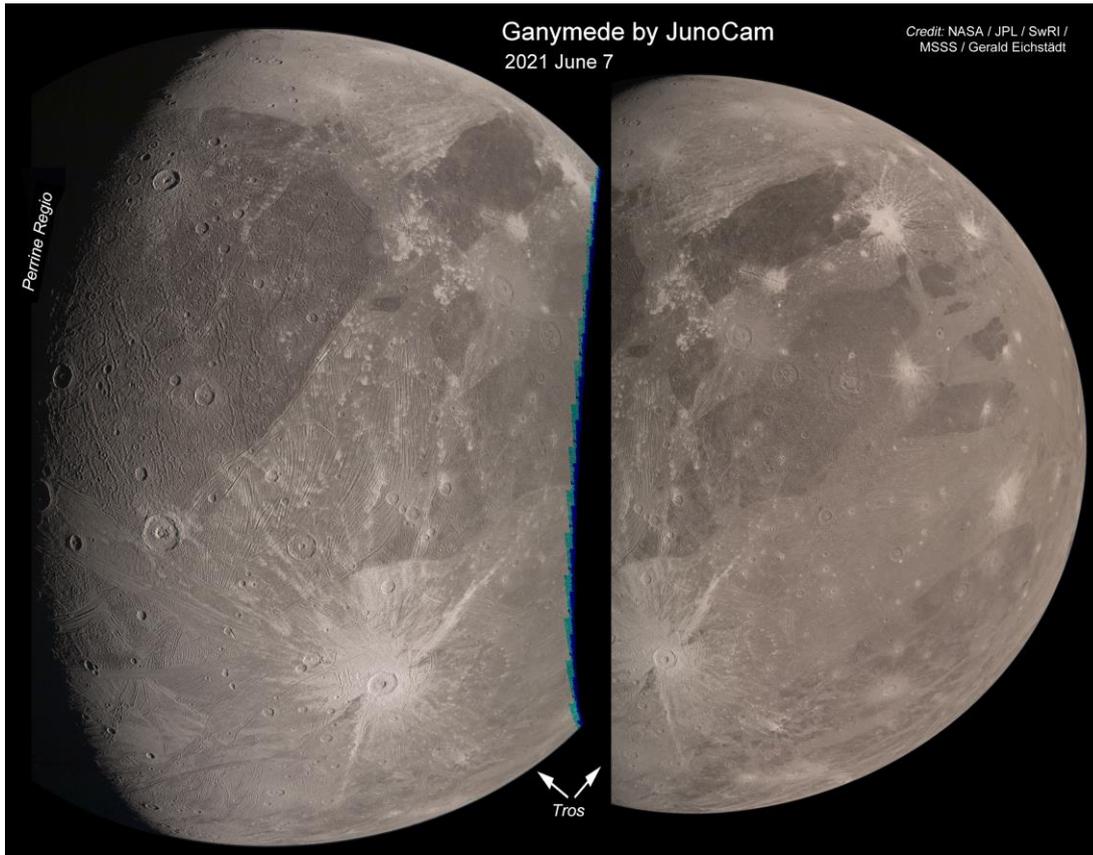


Figure 1.

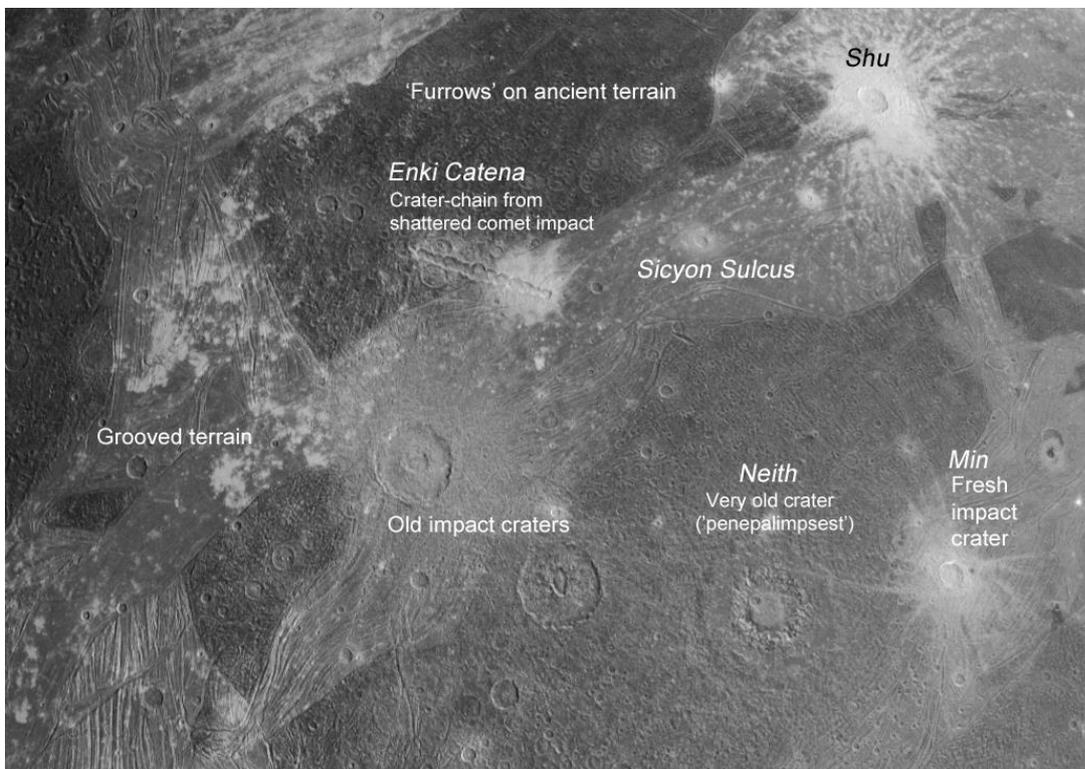


Figure 2.

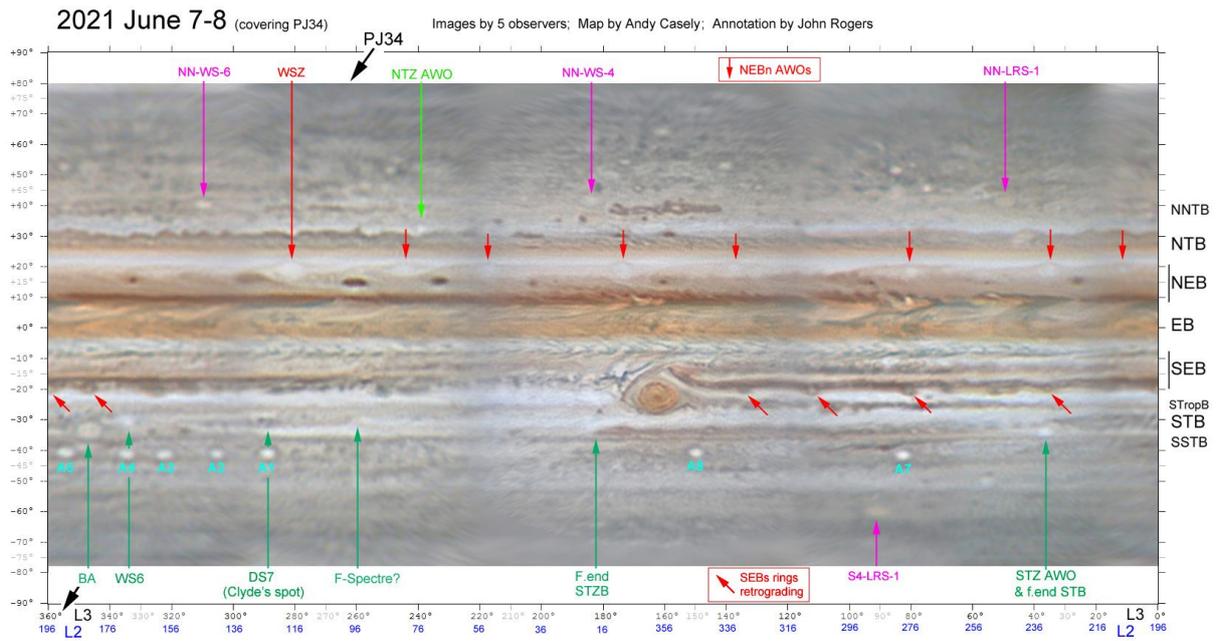


Figure 3.



Figure 4.

[Figure 5 is on next page]



Figure 6

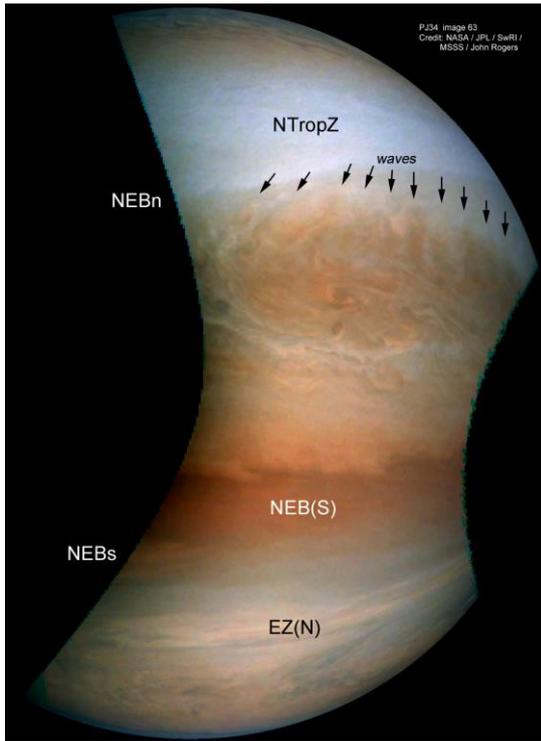


Figure 5.

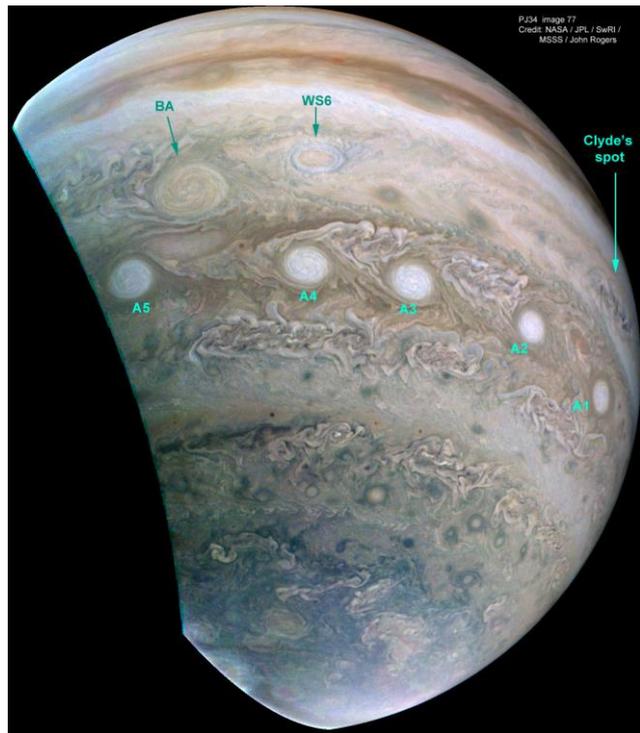


Figure 7.

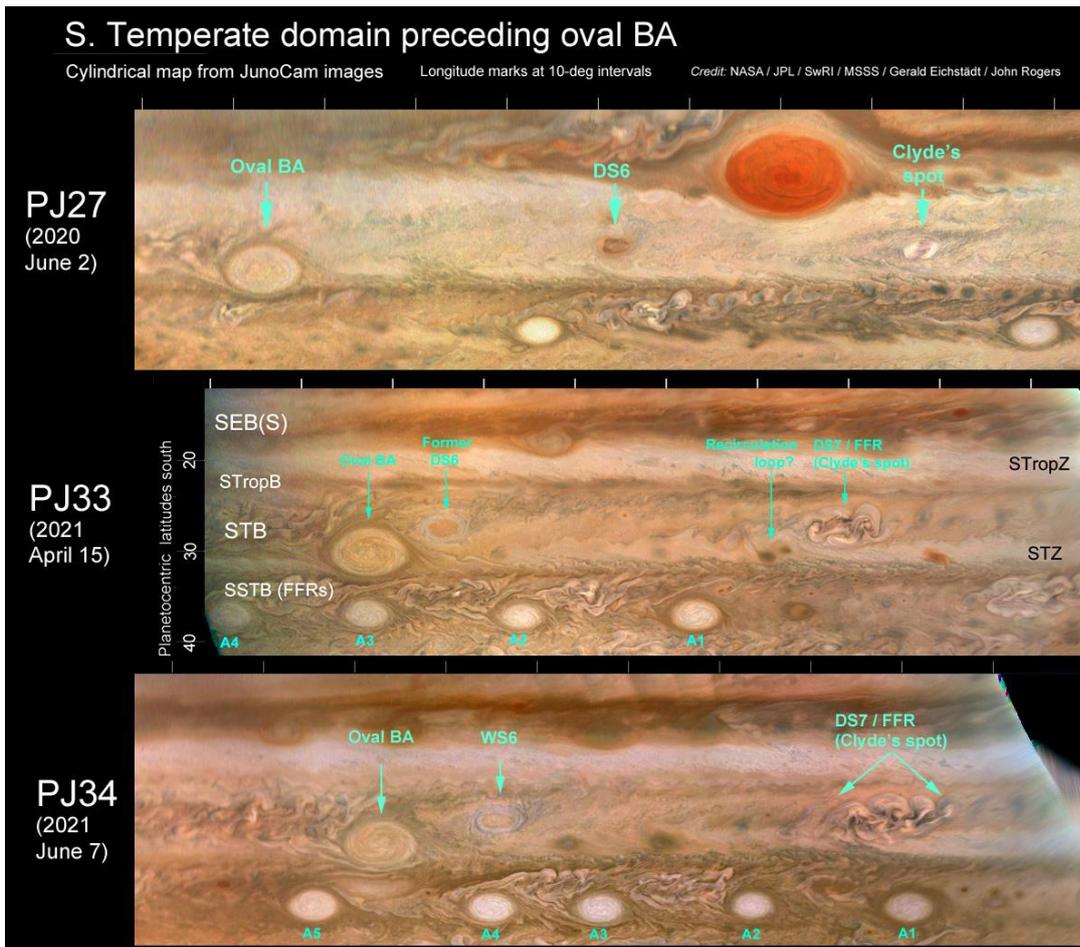


Figure 8.