

JunoCam at PJ36: What the pictures show. Part I.

John Rogers (2021 Oct.10)

Juno's perijove 36 (PJ36) was on 2021 Sep.2, with perijove at 29.9°N (planetocentric; over the NTZ), and equator crossing at L1=225, L2=286, L3=113.5. This report summarises aspects of the images in our usual style. The polar regions will be covered in Part II.

Figure 1 is a ground-based map of Jupiter around that time, produced by Andy Casely.

Figure 2 is our JunoCam map of the planet, again produced by Gerald Eichstädt using an automated procedure and then adjusted for colours and brightness.

With perijove moving northwards, we are now seeing more details of cloud textures throughout the northern hemisphere. Popout clouds, in the bright strips in FFRs, are now visible both north and south of the Bland Zone, i.e. in the N7 as well as N5 domain.

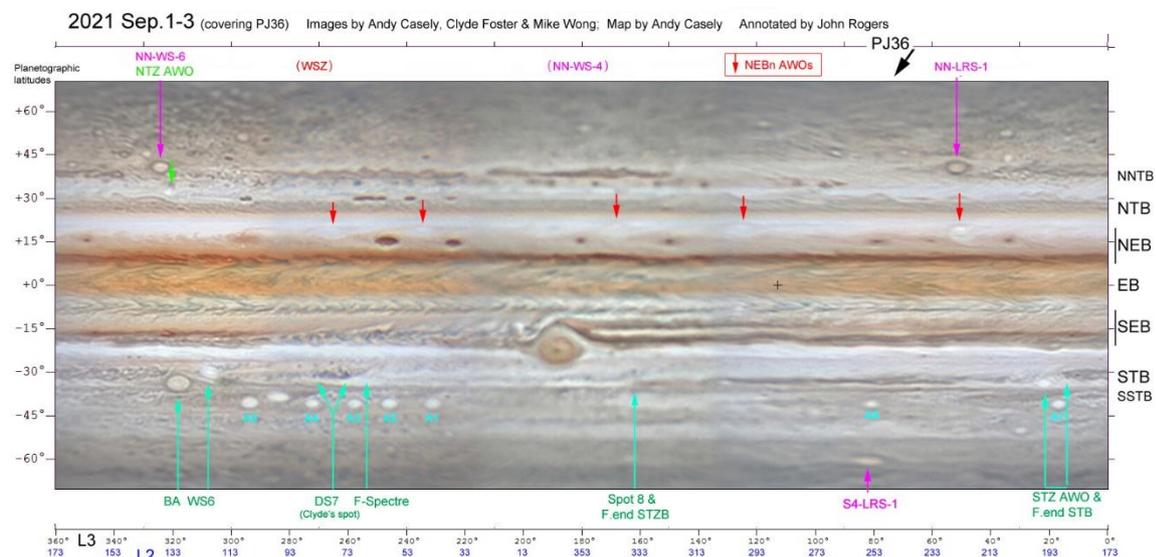


Figure 1.

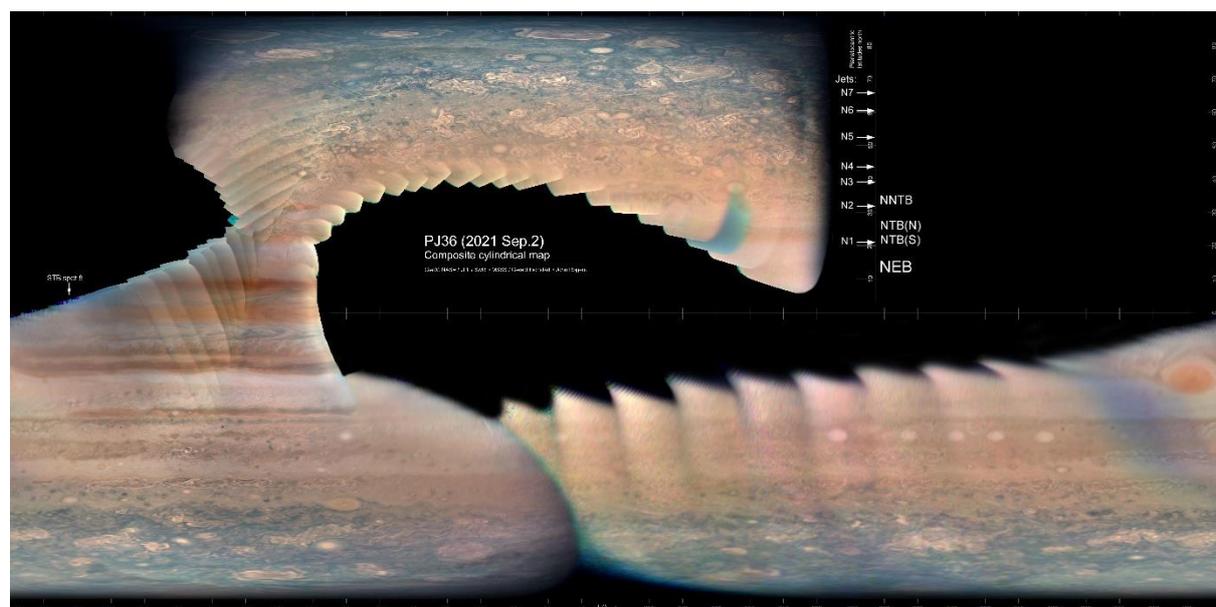


Figure 2.

Details at lower latitudes are shown in Figures 3-5, as follows. Figure 3 is a key to locations shown in Figures 4 & 5, by image number. North is approx. up in all figures.

Figure 4: Image 35: Cyclones in the N4 domain. Image 36: An AWO and a striking cyclonic crescent in the N3 domain. Popup clouds are seen in the AWO and in some peripheral cloud bands, but not in the cyclones.

Figure 5: Novel cloud textures in the N2 (N.N.Temp.) and N1 (N.Temp.) domains. Image 39, at right, gives context for the following panels which are rotated to put north approx. up. Image 38: Two interacting NNTBs jetstream spots. These dark ovals (both presumed to be anticyclonic vortices) were tracked in ground-based images by the JUPOS team and Figure 1 shows them beginning to interact as seen here. Note popup clouds and a red haze band along the rim of the NW vortex. The ochre belt segment in which they are embedded lies along the NNTBs jet. Image 39: This shows a pale ochre, closed cyclonic cell in the northern NTB. On its N edge is a raft of white cloud, similar to the smaller features in image 40 (see below). Inside it are some subtle mesoscale waves (highly enhanced here). Image 40: In the pale ochre NTB(S) are some very small crisp-edged rafts of cloud; these have previously been seen in the southern EZ (discovered by Björn Jónsson in a Voyager image) but not outside the EZ. Now the improved resolution shows them in NTB(S), and a similar feature in NTBn (see above). They somewhat resemble popup clouds but appear calm and unbroken. Image 41: The faded northern half of the NEB is now very bland, but enhancement brings out short-wavelength mesoscale waves. (In this highly enhanced panel the colours may be largely artefactual.) We saw similar waves in the NTZ at PJ35.

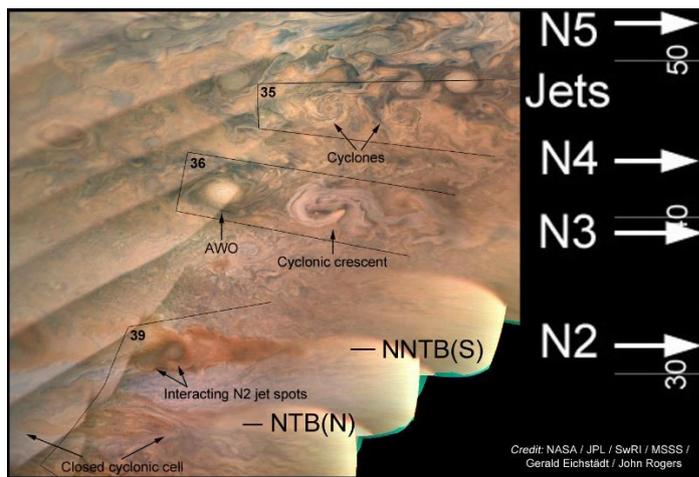


Figure 3.

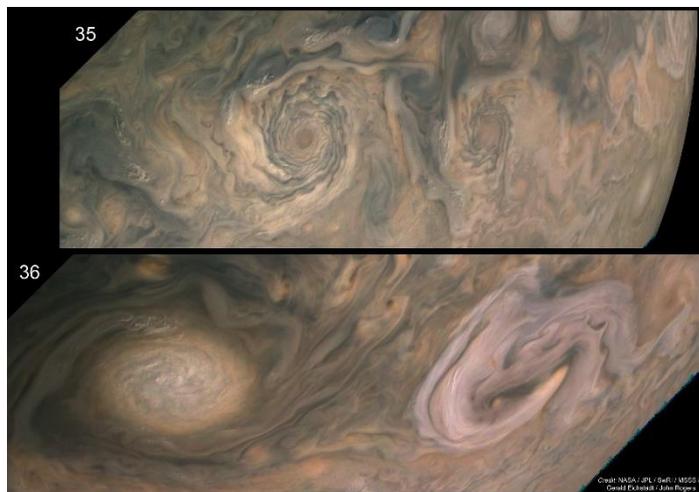


Figure 4.

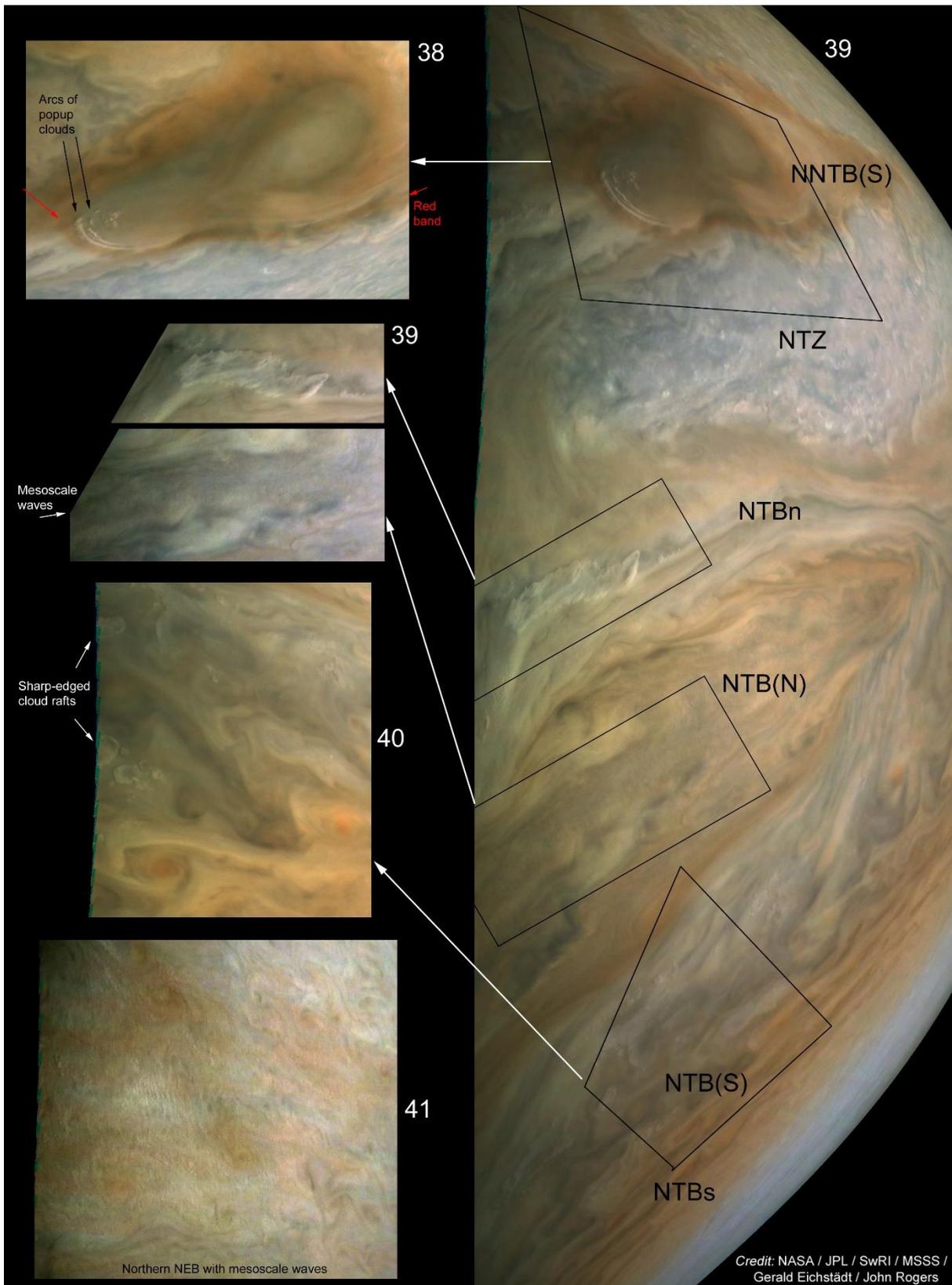


Figure 5.

Mesoscale waves are also seen in the EZ (Figure 6: image 43) and in the SEB(S) (Figure 6: image 46), as at other recent perijoves.

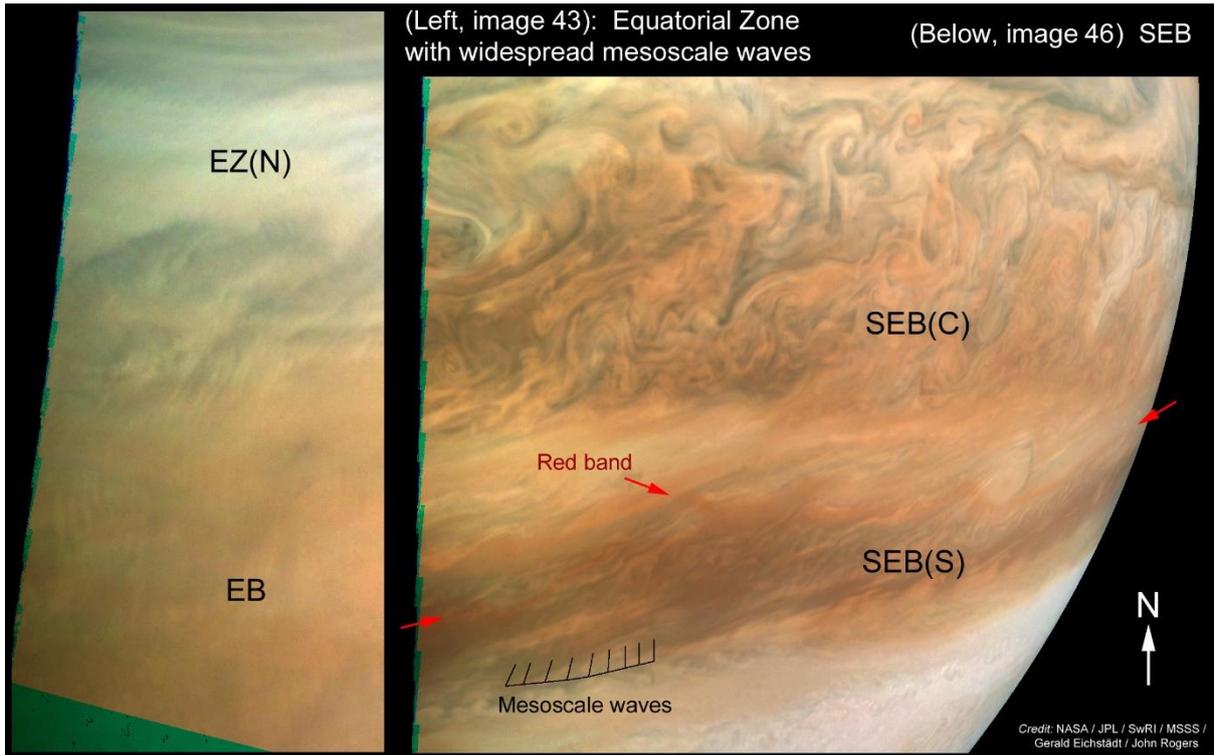


Figure 6.

Figure 7.

The only larger-scale feature of special note was a new outbreak that had appeared in the STB latitudes on August 7. It was apparently an exact repeat of the Clyde's spot outbreak of 2020, i.e. a small bright short-lived convective plume appearing in a previously inconspicuous cyclone, initiating a persistent site of disturbance. This site is shown near the limb in the PJ36 images (Figure 7), and we can see white cloud lobes reminiscent of those in Clyde's spot at PJ27, as well as a long series of eddies and spots that are prograding from the outbreak on the STBn jet.

