Jupiter in 2016/17: Interim Report no. 14

John Rogers, 2017 August 11

This is a short review of images, maps and JUPOS charts up to the end of July. (A more detailed text can be provided on request.) It includes a map of the planet on July 24-28.

As always, I am very grateful to all the contributing observers, and to the JUPOS team, on whose work this report is based.

N4 domain

We continue to track interactions of ovals in this domain (following two mergers described in Report no.9). There was another merger at L2 = 247 (ovals d & f) around May 23.

N2 domain

NN-LRS-1 suddenly lost its dark rim in early June, and again became difficult to see in visible light (just a pale off-white patch), but remained methane-bright as always.

The most conspicuous feature has been a very dark NNTB segment, throughout the apparition, at L2 ~ 310-360. The best images reveal two FFRs in this domain. A long sector of NNTB, from L2 ~ 0-200, became entirely blank white in January (which I attributed to the NTBs outbreak), and is still (July) largely blank except for the chain of dark spots on the N2 jet, which has spread across it from mid-Feb. onwards.

N2 jet: It is now evident that a major outbreak of dark spots on the NNTBs jet started in mid-Feb., and is still continuing. They all appear near L2 ~ 220 (occ. up to 250); this is tens of degrees downstream from a large FFR. They almost all disappear or shrink or decelerate on reaching the dark NNTB segment near L2 ~ 0.

N. Temperate domain

The revived dark grey NTB(N) was originally uniform in longitude apart from the long-lived rifted sector, which has persisted through July. A second, shorter rifted region (~20 deg long) was present from April to June, then in July it transformed into a very dark streak. Thus the NTB(N) is beginning to differentiate into darker and lighter sectors.

The featureless orange NTB(S) is still prominent.

N. Tropical domain

The NEB has rapidly undergone a complete NEB expansion event, and is now fully broadened to the north. In the typical sequel, AWOs and barges are forming within the expanded NEBn, as decribed in Report no.11. Methane-dark waves are still very prominent over large sectors of the NEB, up to the last methane images taken in early July.

Four AWOs seem to be stabilising (provisionally named WS-d, -a, -b, and the long-lived WSZ). WS-a is still fast-moving. It has merged with one or two more transient small AWOs, and is now converging on another one (WS-k), with a barge between them. Some or all of these spots may be about to form a regular array of alternating barges and AWOs.

> *See also:* Report on NEBn white spots in 2017, by S. Mizumoto of the ALPO-Japan, with complete sets of strip-maps: http://alpo-j.asahikawa-med.ac.jp/kk17/j170724r.htm

Chris Go pointed out that ‘White’ Spot Z, which had reappeared as a whitish oval in the expanded NEBn, appeared slightly reddish in his image on July 7, and also unusually bright in

his methane image. The reddening (a pale brown tint) was confirmed by F.& G. Carvalho, and in images by other observers thoughout July.

NEB rift activity is much reduced and is at a low level in June-July, except for some small rifts in the south part. But several new ones, albeit short-lived, have continued to erupt as brilliant white points on the south edges of barges in July, and to expand rapidly thereafter. These new ones were recorded in Miyazaki's images on July 1 (L2 = 240.5; on July 10-11 it was expanded and JunoCam took a closeup of it); July 23 (L2 = 239; beautifully expanded by July 25, see map from Carvalho image); and July 31 (L2 = 14).

S. Tropical domain

The mid-SEB outbreak produced no further white spots at the original source since March; the f. end has been prograding since then with DL2 ~ -13 (approx. keeping pace with oval BA), though the large white spots (cells) generated in the outbreak are still conspicuous. But a new white spot appeared further f. at L2 = 146 on July 8, and again on July 22 (Carvalho & Miyazaki), indicating renewed activity at the f. end. There is still the larger brown barge following the mid-SEB outbreak and p. the GRS.

The GRS has continued to shift up in L2, beyond its previous trend, so its mean DL2 from 2017 Jan.-July has been +2.2 deg/month – unprecedented in times when the SEB is not faded. So at perijove-7 on July 11 it was at L2 = 275 (L3 = 59), 1 deg higher than predicted, but still perfect for Juno's fly-over at L3 = 58.

S. Temperate domain

Oval BA has mean DL2 = -11.5 (±0.2) deg/month, but oscillates between ~-9.5 and ~-13.3, since the start of 2017. The mean period is 65 days but it varies between ~50-90 days so it is not as regular as the GRS. Similar oscillations were also occurring in 2015 and 2016, with periods in the same range, but were less obvious because of more longer-term variability in the drift rate then.

In April-May there were many strongly retrograding spots in the chain Sf. oval BA, and oval BA had a grey rim, all no doubt due to continuing activity in the dark spot just f. BA. But this activity ceased in mid-May, so the retrograding spots disappeared in June-July and BA has no grey rim.

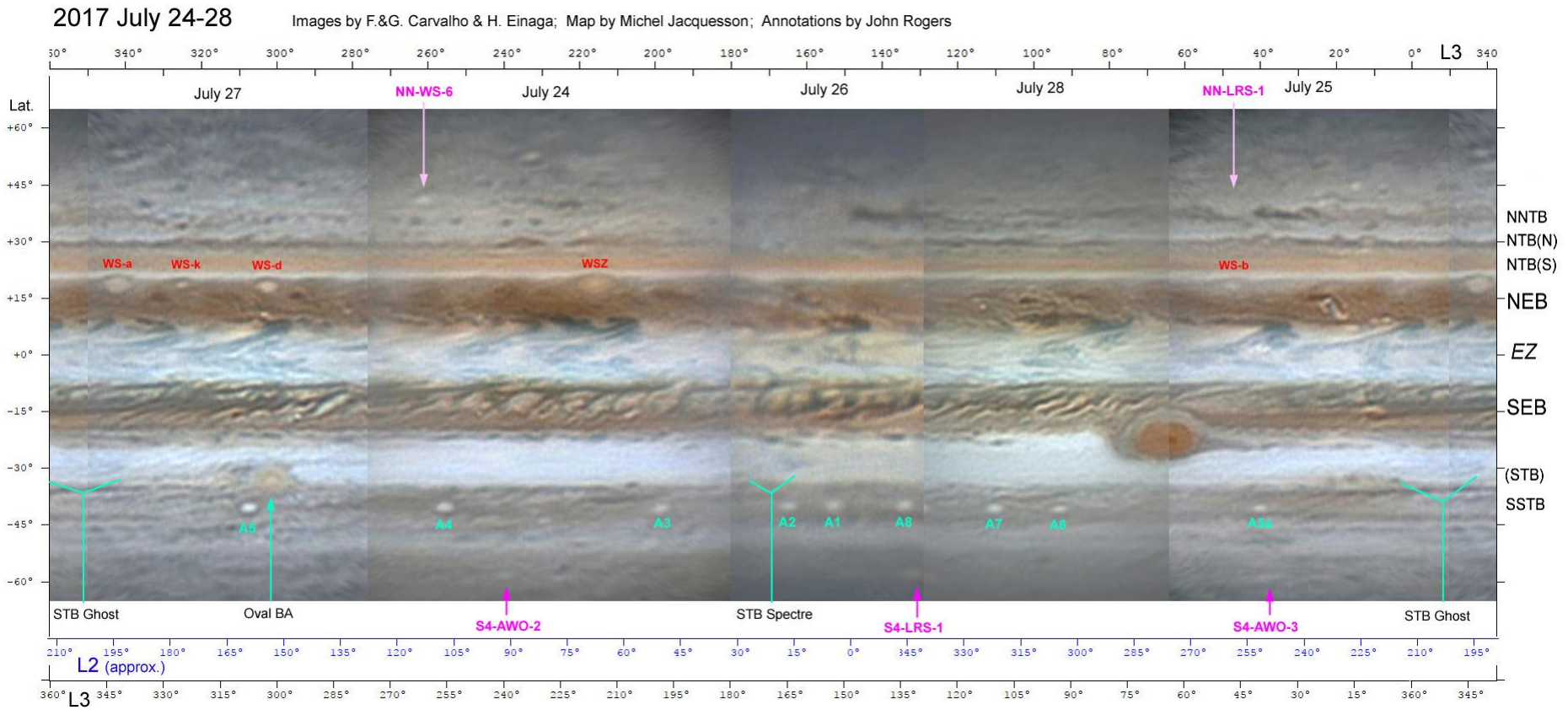
The STB Ghost is now (July 30) ~31º f. the dark spot f. BA, so should catch up with it in early 2018. Many SSTBn jet spots are impinging on the STB Ghost and halting or recirculating there, as they were earlier at the STB Spectre.

S2 domain

Five AWOs in the chain (A6-A7-A8-A1-A2) now have the remarkably fast mean DL2 of -32.5, though individual ones are oscillating. The other four have DL2 from -32 to -28.

The sector between A3-A4 was white in May and early June, but then became darkened in its p. half, and seems more generally disturbed on July 24. There is still a large FFR f. A5.

AWO-A5a continues to absorb even smaller AWOs generated by the large FFR some way p. it. Another of these mini-mergers occurred in late June: the smaller spot was almost in contact with A5a on June 17 (S. Kidd), then there was a single large (merging?) oval on June 20, and one normal AWO (A5a) thereafter.


2017 July 24-28
Images by F.&G. Carvalho & H. Einaga; Map by Michel Jacquesson; Annotations by John Rogers
L3
July 27
NN-WS-6
July 24
July 26
July 28
NN-LRS-1
July 25
Lat.
+60°
+45°
+30°
+15°
+0°
-15°
-30°
-45°
-60°
WS-a
WS-k
WS-d
WSZ
WS-b
A5
A4
A3
A2
A1
A8
A7
A6
A5a
NNTB
NTB(N)
NTB(S)
NEB
EZ
SEB
(STB)
SSTB
STB Ghost
Oval BA
S4-AWO-2
STB Spectre
S4-LRS-1
S4-AWO-3
STB Ghost
L2 (approx.)
L3