

- **2019 GRSフレーク／その後の変化**
- **Juno PJ21画像**

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@月惑星研究会 ALPO-Japan



# GRSフレーク(Flake)とは？



Juno PJ12 (2018/04/01)

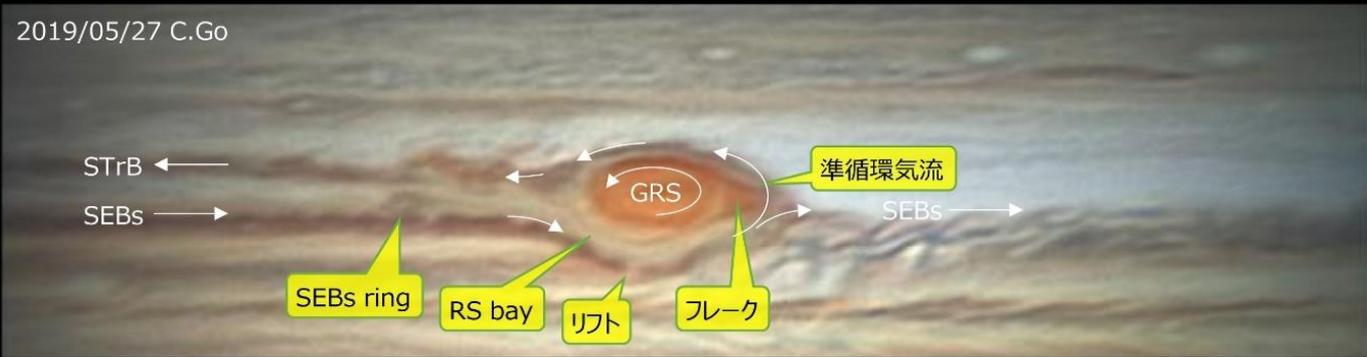
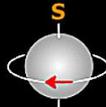
Credit : NASA/SwRI/MSSS/Gerald Eichstädt/Seán Doran

GRSとSEBsリング暗斑（何れも高気圧的渦）  
の相互作用で発生する



Juno PJ18 (2019/02/11)

Credit : NASA/SwRI/MSSS/Gerald Eichstädt/Seán Doran



(John Rogers)

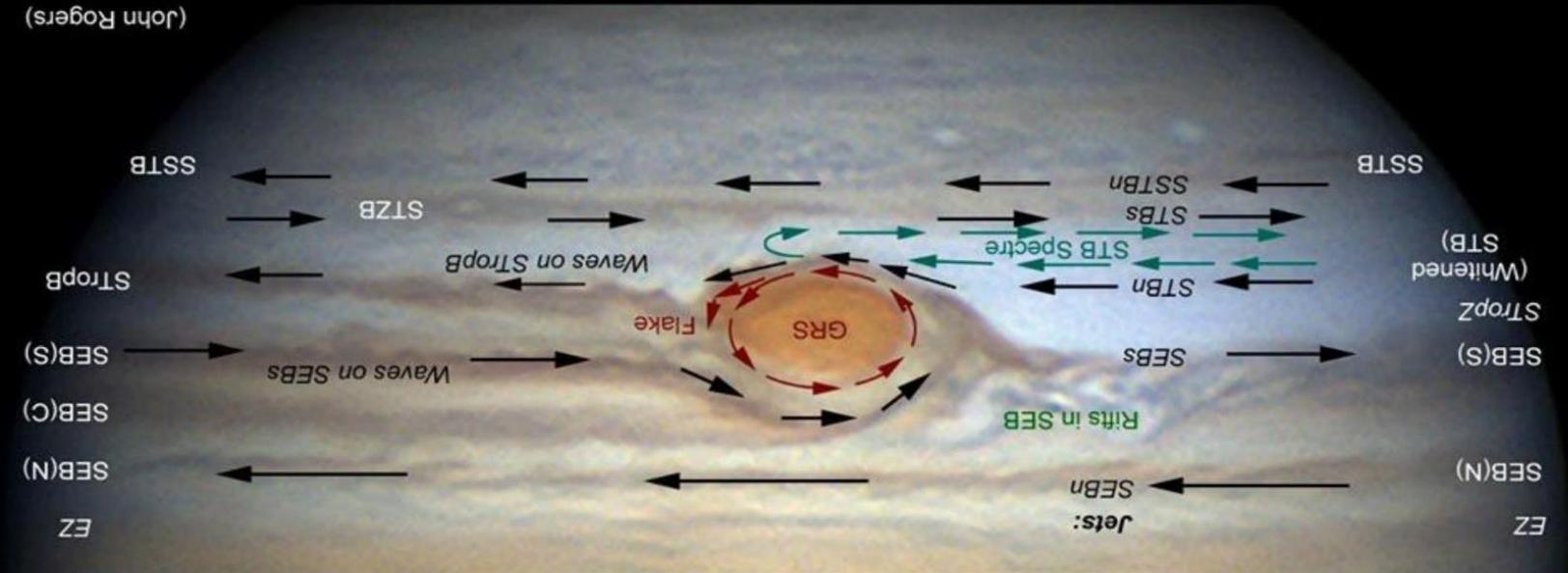
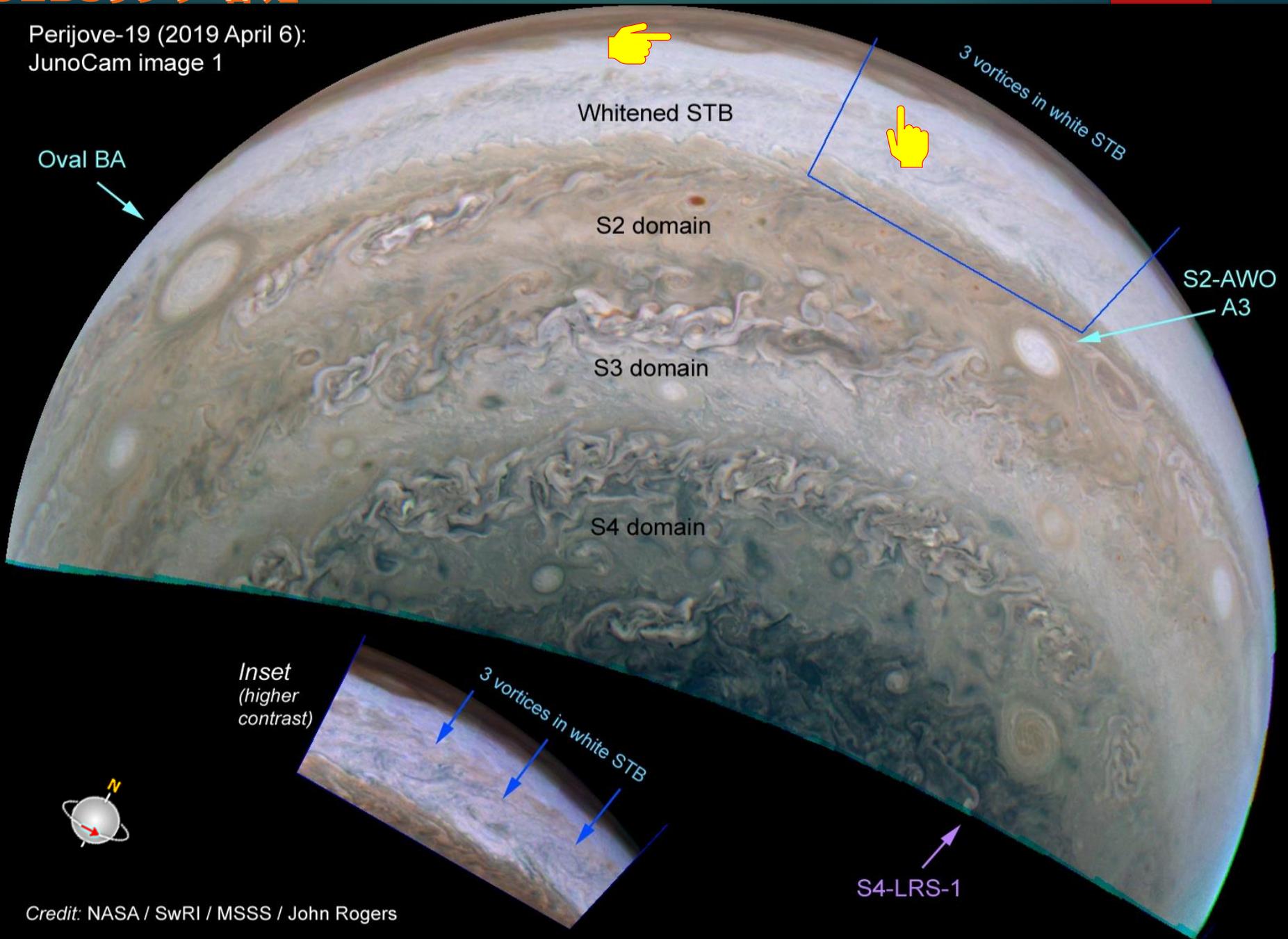


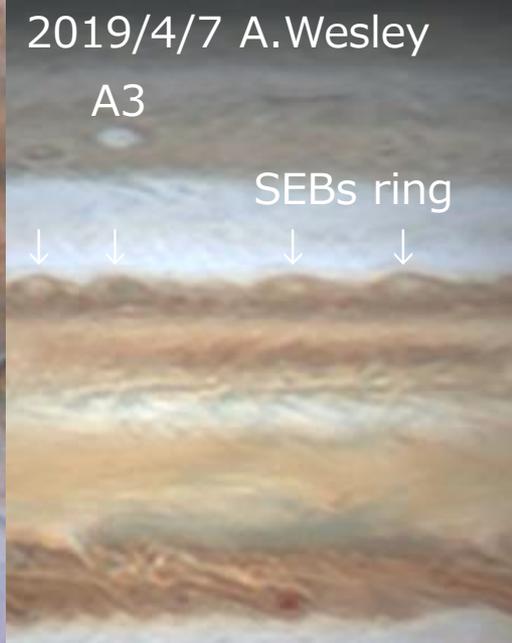
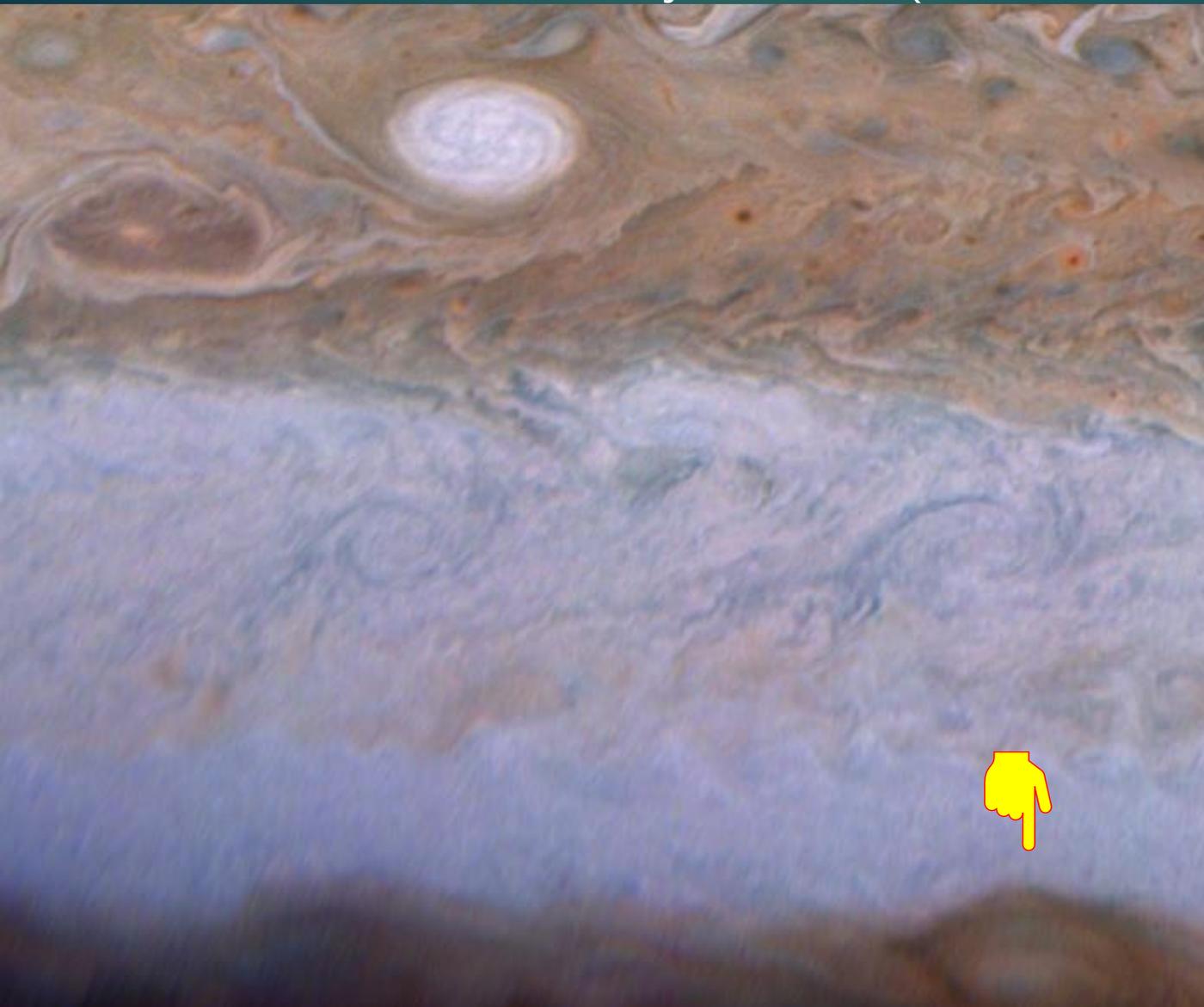
Diagram of the likely currents in the GRS region  
 Base image: 2019 May 22, 14:55 UT, by D.P. Millika & P. Nicholas (Australia)

Perijove-19 (2019 April 6):  
JunoCam image 1



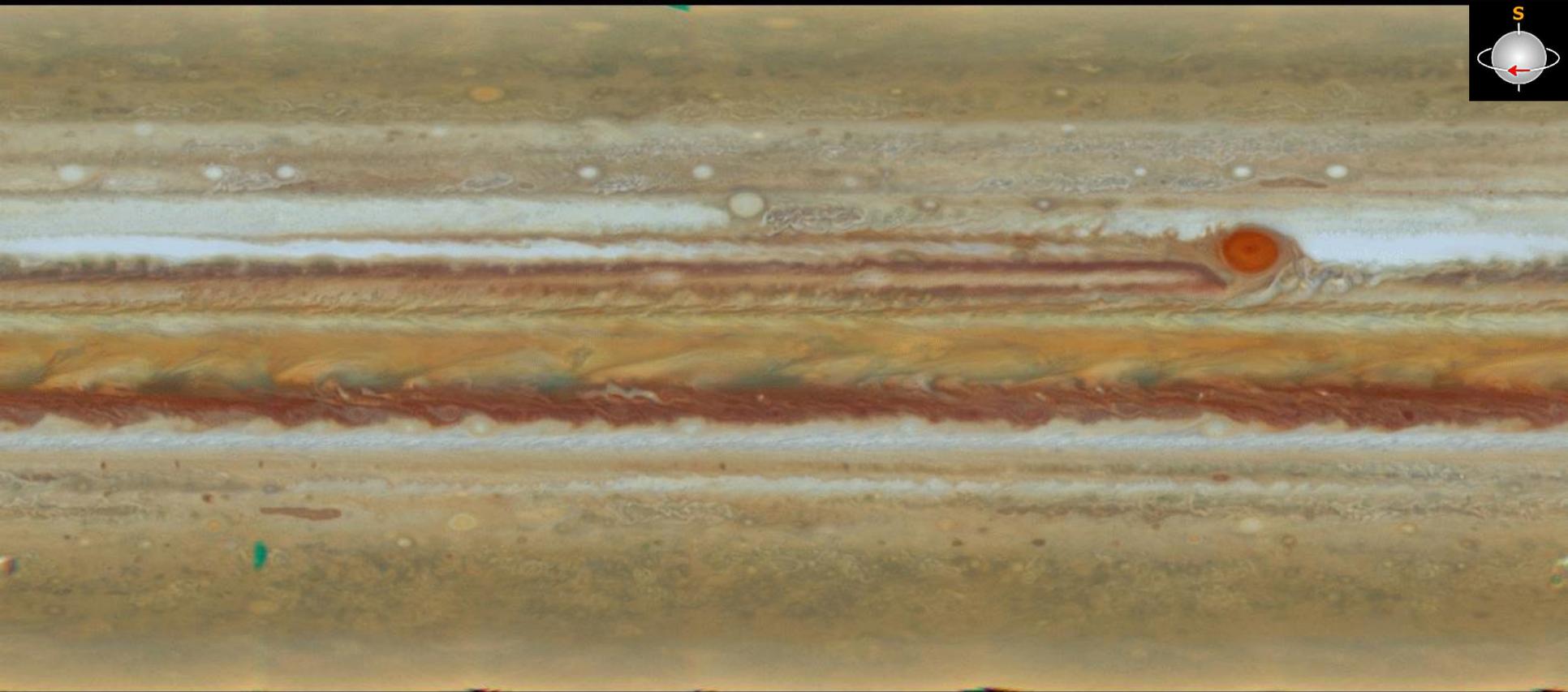
# SEBsリング暗斑

Credit : NASA/JPL-Caltech/SSI/Björn Jónsson (Juno PJ19 2019/4/6)



SEBs ringは高気圧的渦 (南半球 : 左巻き)

HST-OPAL Cycle 26 Jupiter, 2019 June 26 08:14 ~ 16:37 UT (Map A)



HST-OPAL(Outer Planet Atmospheres Legacy) Cycle 26

Map A : 2019/6/26 08:14 ~ 16:37 UT

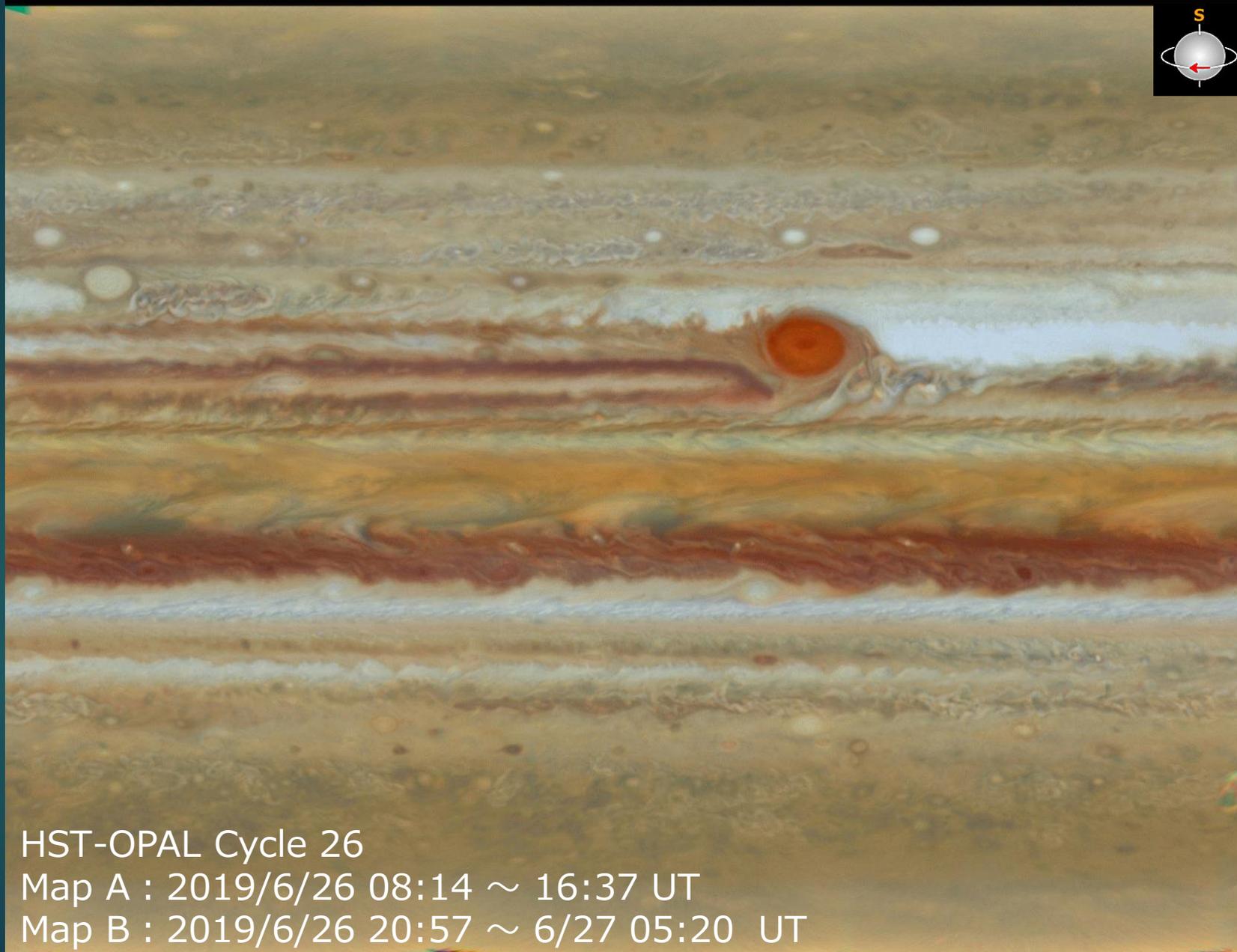
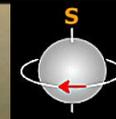
Map B : 2019/6/26 20:57 ~ 6/27 05:20 UT

約半日を隔てた木星面の変化を見ることができる。

注目はGRSの北(下)、RS bayリフト付近に行くSEBs ringの変化。

# GRSフレーク & SEBsリング暗斑

7p

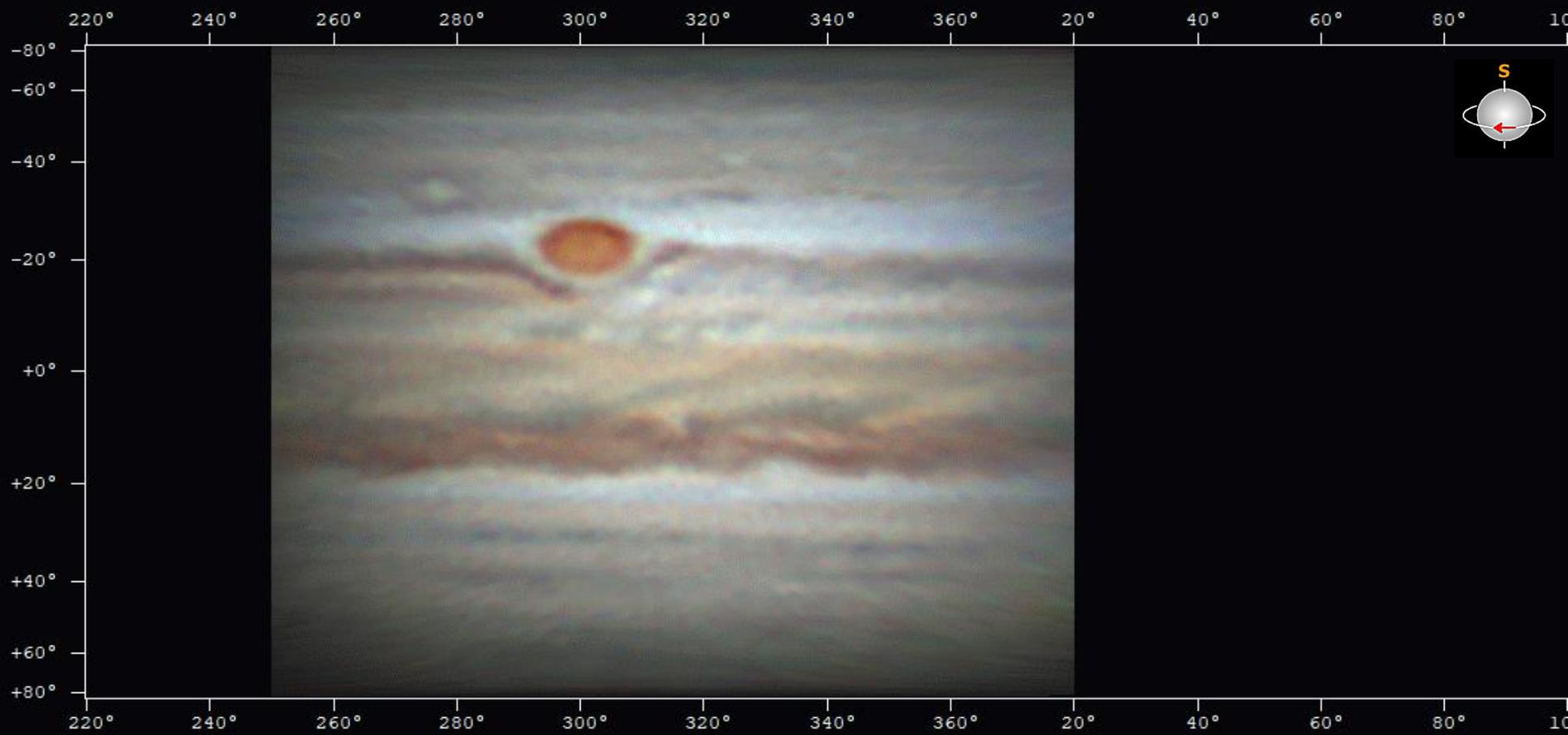


HST-OPAL Cycle 26

Map A : 2019/6/26 08:14 ~ 16:37 UT

Map B : 2019/6/26 20:57 ~ 6/27 05:20 UT

Date	UT	Observer	Channel	Longitude	Sy.	Latitude
2019 Jan 18	02:50.0	C.Foster	Colour	250°... 20°	2	-90°...+90°



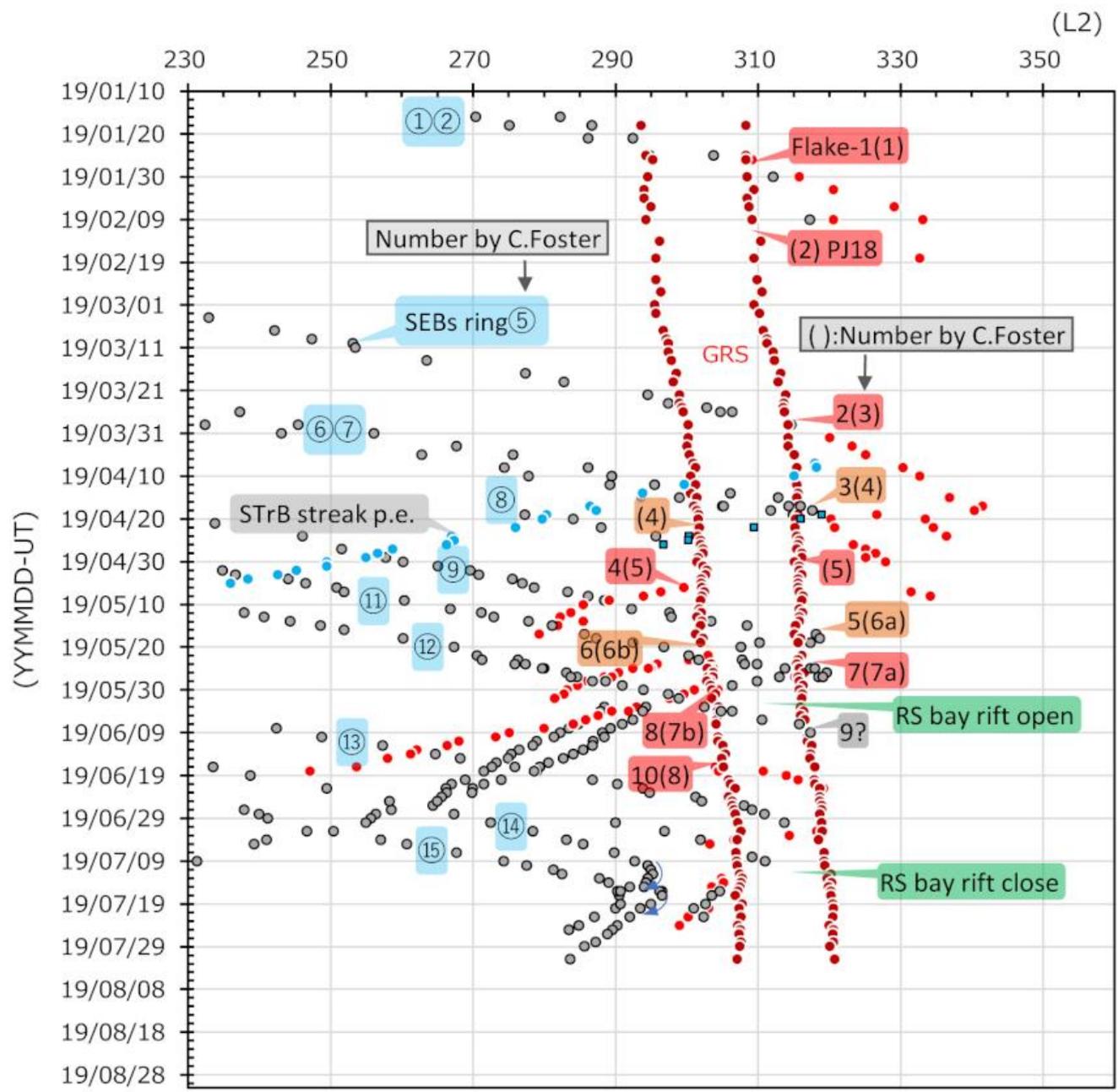
Longitudes in System 2, planetographic latitudes  
Lambert cylindrical equal-area projection

2019/1/18~2019/8/1 展開図 gif動画 (189枚)

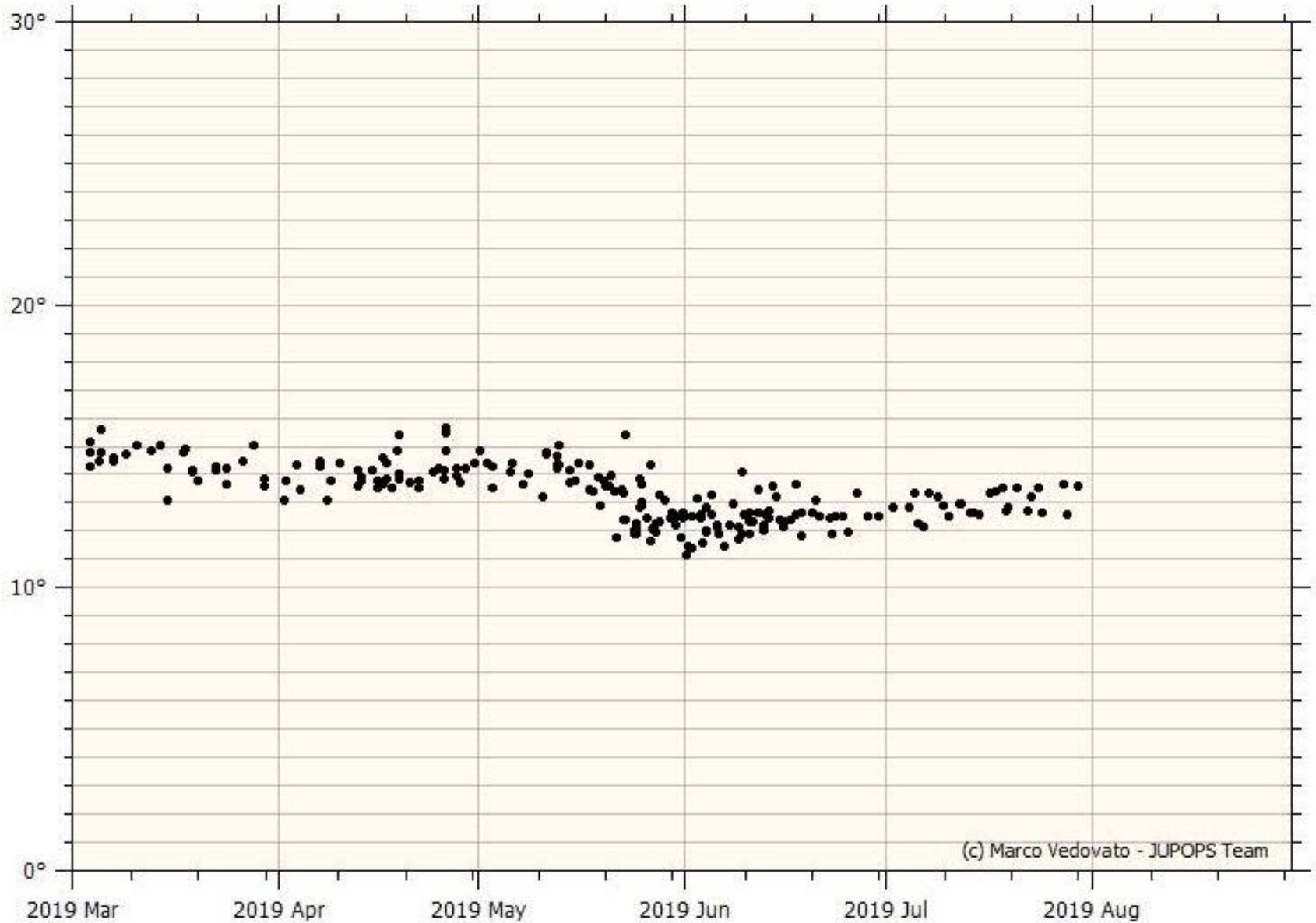
## 2019 Jupiter / GRSフレークと関連現象

2019/7/31

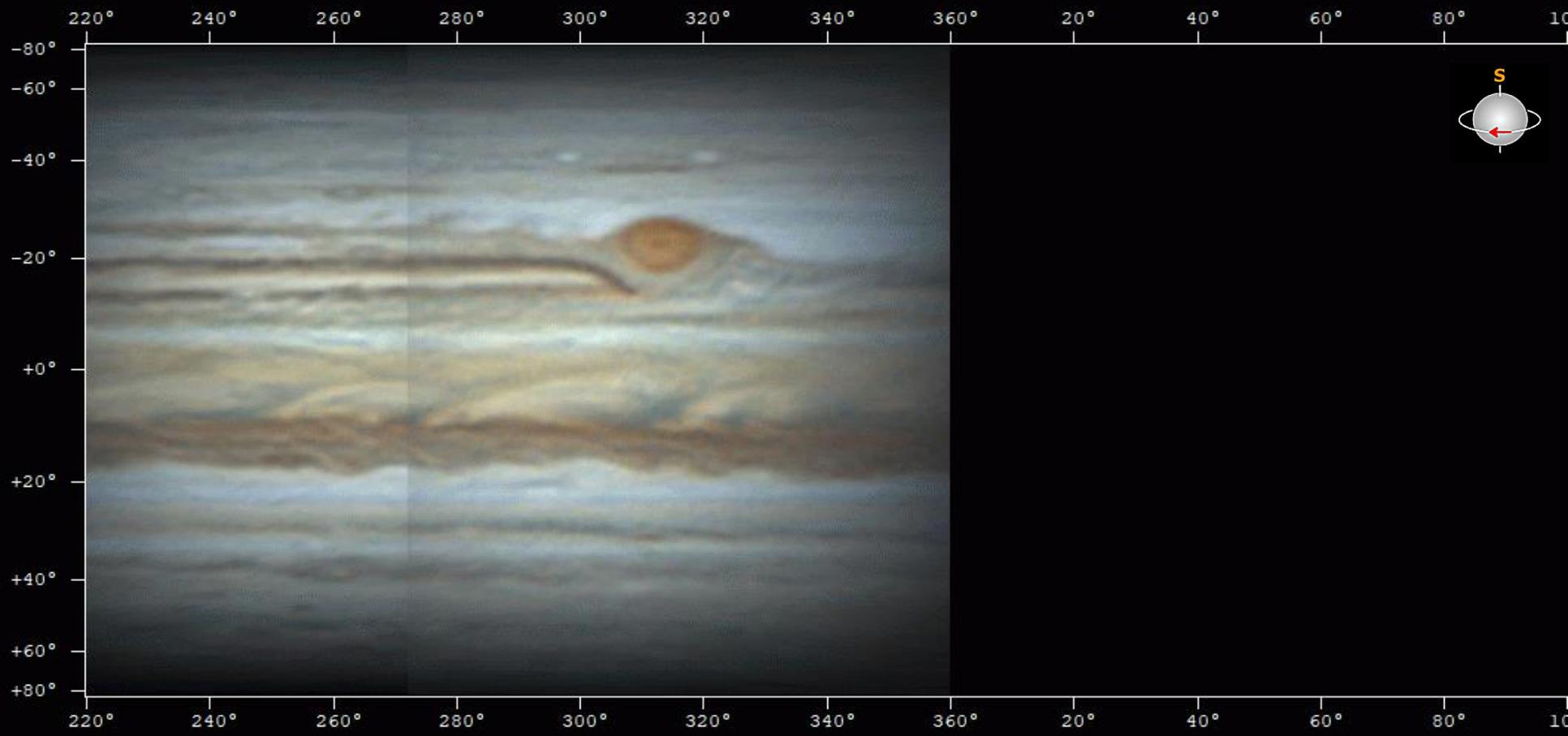
Flake No.	SEBs ring		フレーク出現場所・日付		フレーク CH4 bright	STrB streak	bay リフト 'Chimney'	bay後端 準循環気流	bay後方 SEBsの流れ	Notes
	ring No.	bay 進入日	GRS後端	GRS前端						
0	?	?	?	?	?	(×)	(閉)	(×)	(○)	Juno PJ17(2018/12/21)画像
1	1,2	Jan.21,24	Jan.25	---	○	×	閉	×	○	
2	4	?	Feb.9-12	---	○	×	閉	×	○	Juno PJ18(2019/02/12)画像
						Apr.3~ ○	Mar.4 開?	Apr.1?~ ○	Apr.1?~ ×	
3	5	Mar.23	Mar.27	Apr.1	○	×	開?	○	×	ring-5はリフトの影響を受けた?
4	6,7	Apr.12,15	Apr.15-17	Apr.22	○	○	Mid Apr. 閉	○	×	Large event.
5	8	Apr.24	Apr.30	May 6	○	○	閉	○	×	
6a,b	9	May 13	May 17	May 21-23	○	○	閉	○	×	Large event.
7a,b	11	May 22-23	May 25-26	May 30	○	○	閉	○	×	Large event.
8	12	Jun.1	---	---	---	○	Jun.3 開	○	×	ring-12の一部がリフトから漏れ出す?
		?	Jun.20-21	Jun.15-17	△	○	開	○?	×	Disturbance circumnavigating GRS.
9	13	Jun.25	Jun.30	Jul.4-5	△	○	開	△?	×	(Small ring-13 had dissipated.)
		?	Jul.8	Jul.12-14	△	○	開	×?	○	Disturbance circumnavigating GRS?
						Jul.12~ △	Jul.12 閉	Jul.5?~ ×	Jul.5~ ○	
---	14,15	---*	---	---	---	△ gap	閉	×	○	*Jul.12~ ring14,15は南ヘシフト→STrB STBからGRS前方へ白雲進入?



$14^\circ \rightarrow 12^\circ \rightarrow 13^\circ$



Date	UT	Observer	Channel	Longitude	Sy.	Latitude
2019 Jul 07	01:49.0	J.L.Pereira	Colour	220°...272°	2	-90°...+90°
2019 Jul 07	02:42.0	J.L.Pereira	Colour	272°...360°	2	-90°...+90°

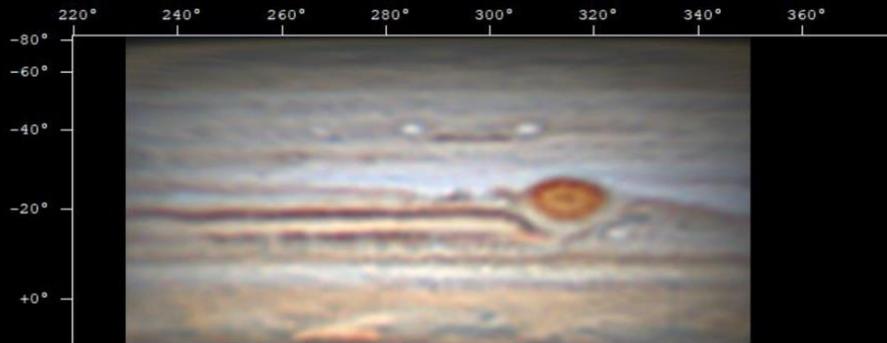


Longitudes in System 2, planetographic latitudes  
Lambert cylindrical equal-area projection

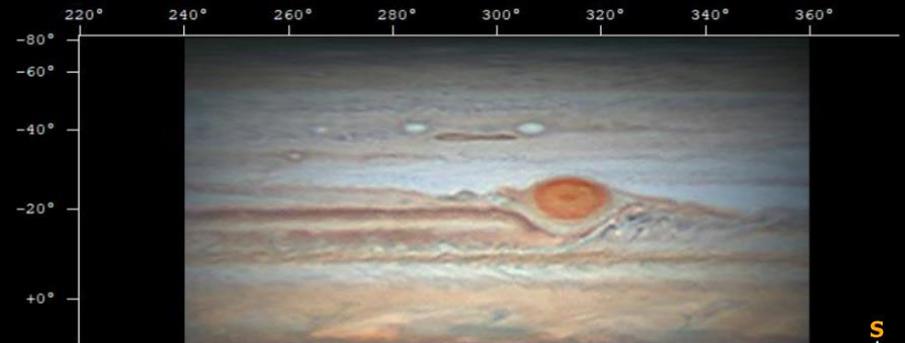
2019/7/7~7/24 2個のSEBsリング暗斑が南へシフト → 停滞 → 逆行  
なぜ逆行？ → STBからGRS前方へ進入(7/10~14)した白雲の影響？

## Juno PJ21(2019/07/21)

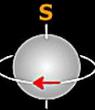
Date	UT	Observer	Channel	Longitude Sy.	Latitude
2019 Jul 21	04:00.0	F.Maxson	Colour	230°...350°	2 -90°...+90°



Date	UT	Observer	Channel	Longitude Sy.	Latitude
2019 Jul 20	18:21.9	C.Foster	Colour	240°...360°	2 -90°...+90°



Credit : NASA/JPL-Caltech/SwRI/MSSS/Kevin M. Gill

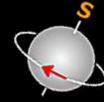


Credit : NASA/JPL-Caltech/SwRI/MSSS/Kevin M. Gill



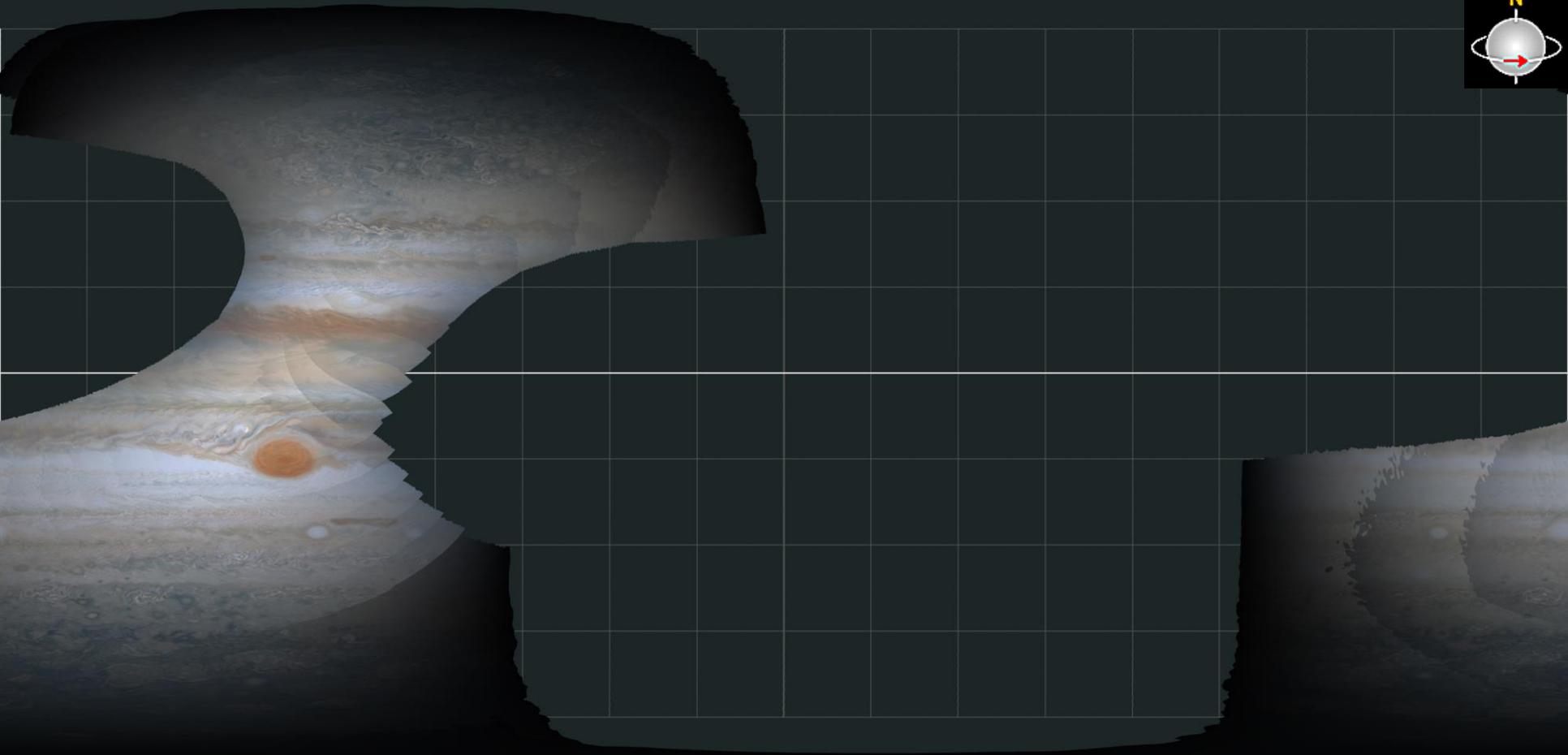


Credit : NASA/JPL-Caltech/SwRI/MSSS/Kevin M. Gill



Fish-eye marble view

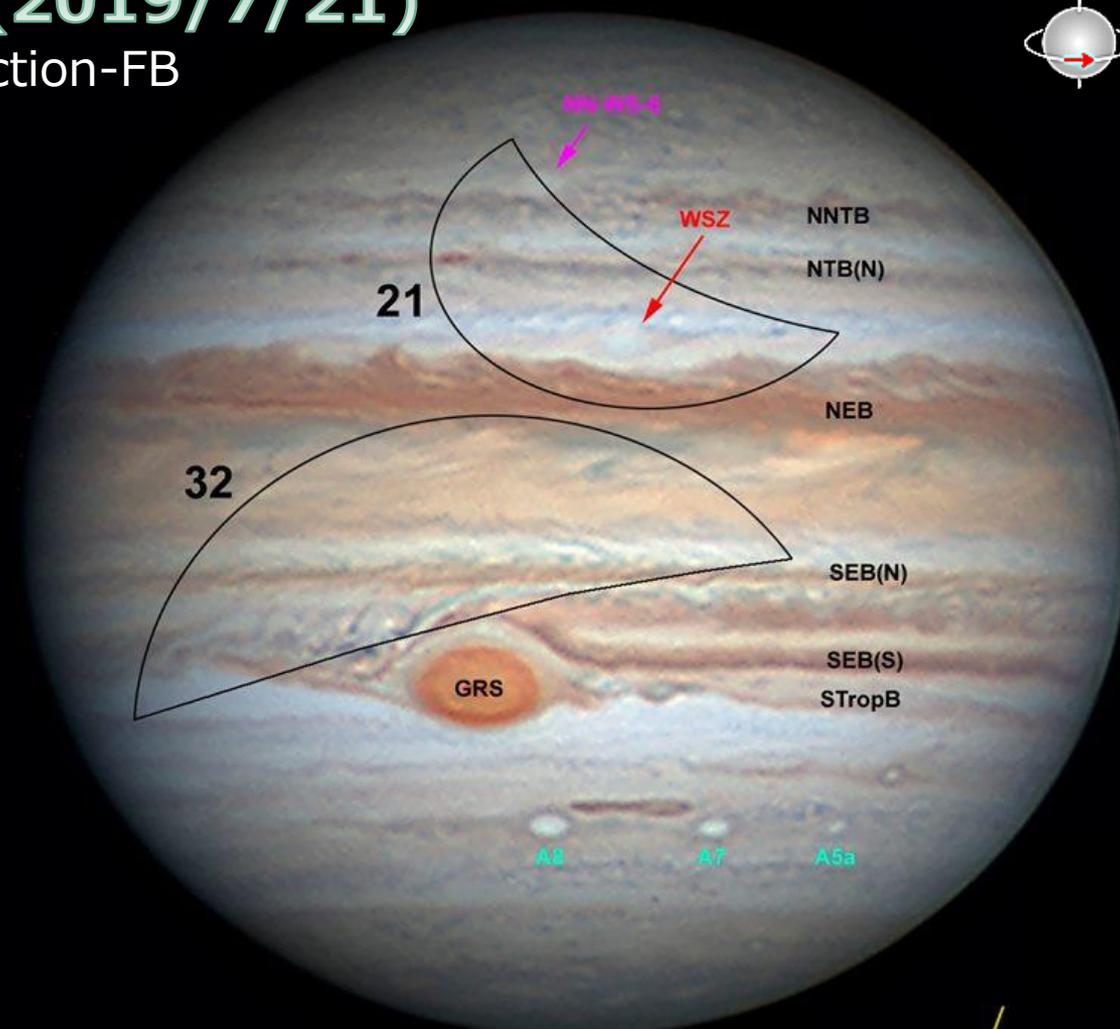
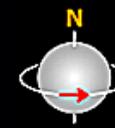
Credit : NASA/JPL-Caltech/SwRI/MSSS/Brian Swift & Clyde Foster



Junoの軌道は極で遠く、赤道で近い → 得られる画像：極で広範囲、赤道で狭い範囲  
得られた画像をモザイク合成したものが上の画像

# Juno PJ21(2019/7/21)

BAA Jupiter Section-FB



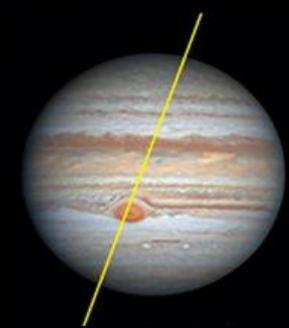
20 July 2019  
18:22UT  
I 87 II 303 III 284

Juno PJ21  
One rotation(+10h)  
before flyby

Clyde Foster  
Centurion, South Africa

355mm SCT  
f/27, 2.5x Televue Powermate  
ZWO ASI290MM  
Baader RGB(IR cut) filterset

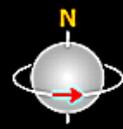
*Image footprints labelled by John Rogers*



Approx PJ21 Track

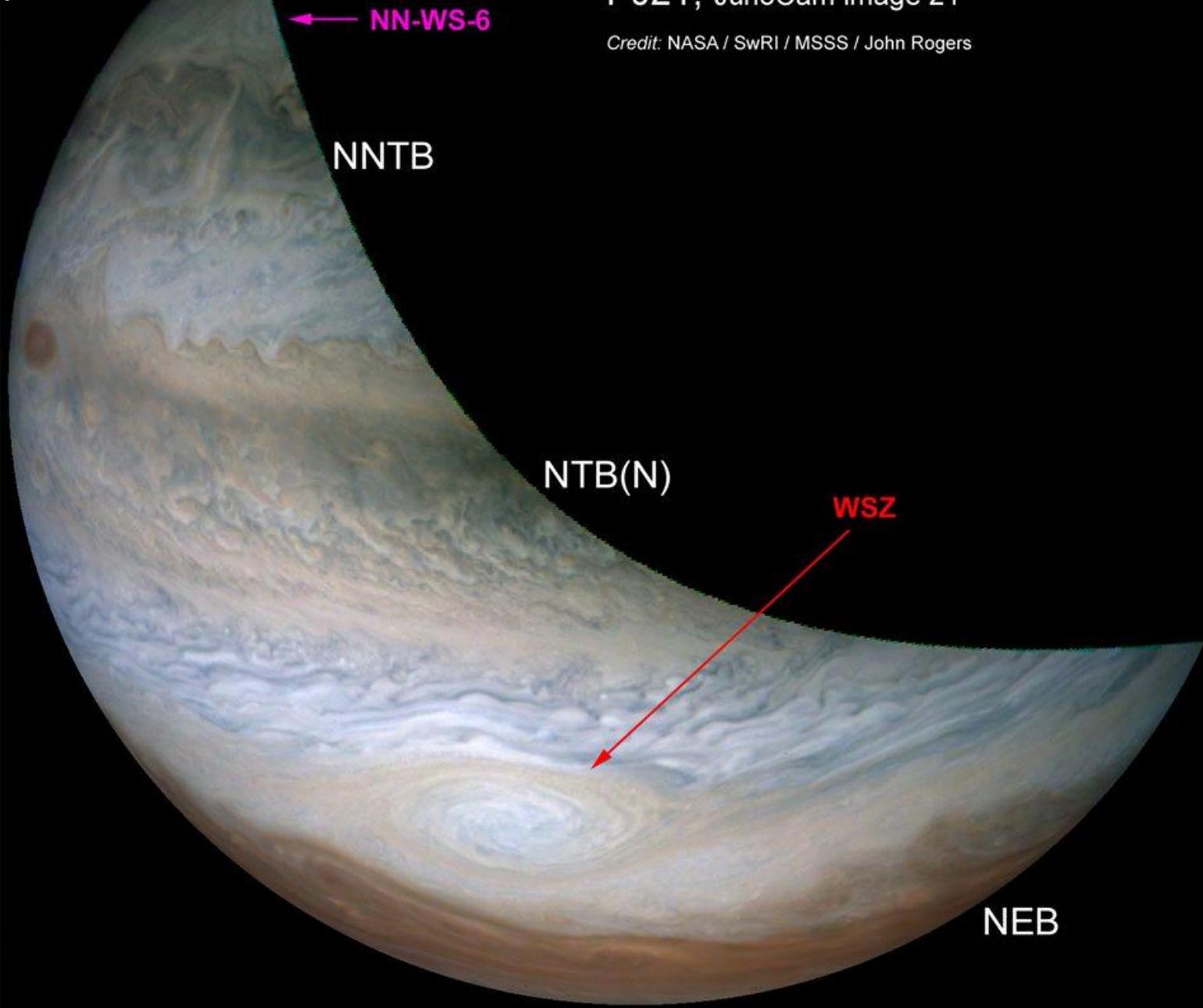
# Juno PJ21(2019/7/21)

BAA Jupiter Section-FB



PJ21, JunoCam image 21

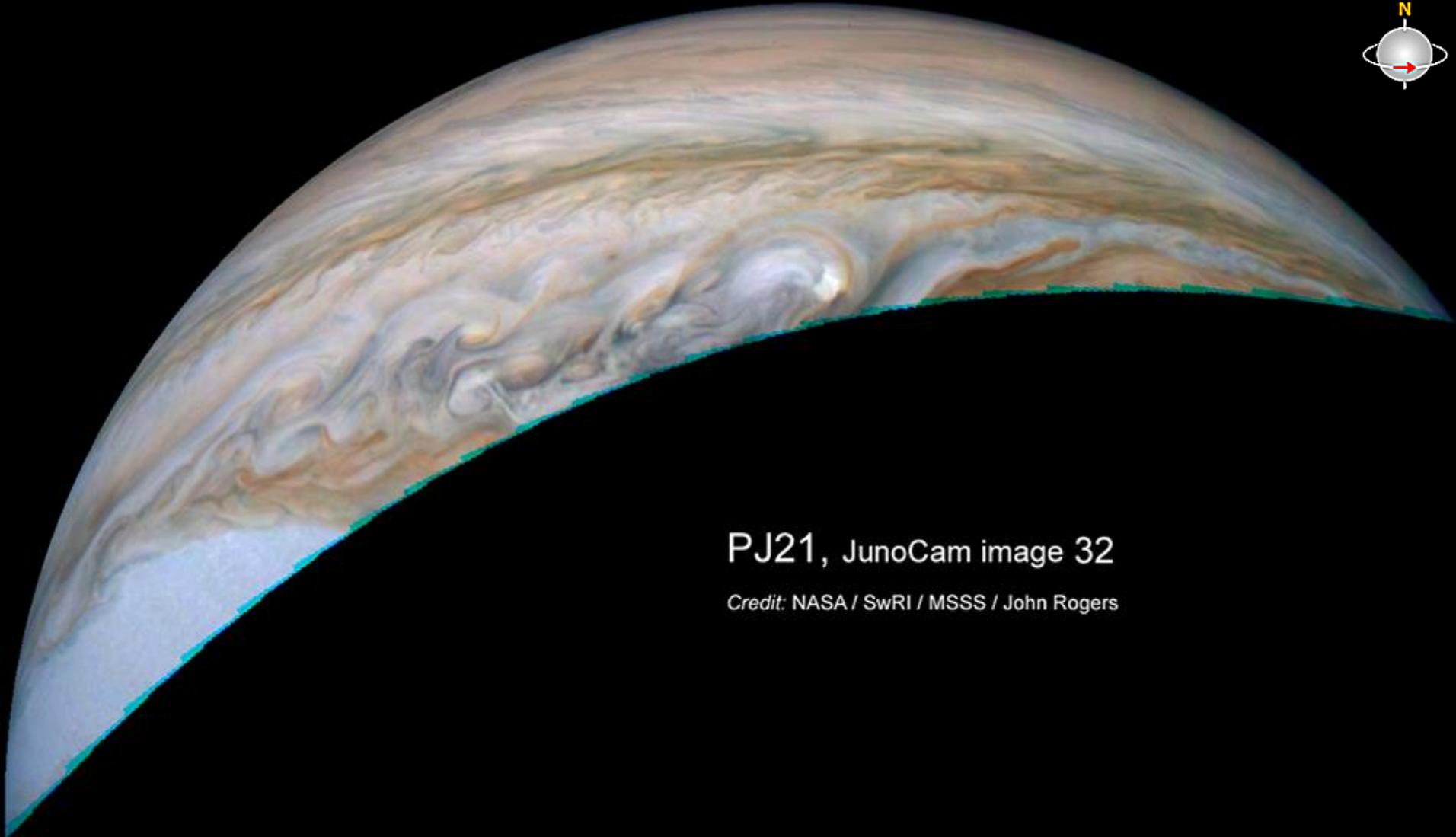
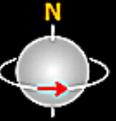
*Credit: NASA / SwRI / MSSS / John Rogers*



# Juno PJ21(2019/7/21)

BAA Jupiter Section-FB

20 p

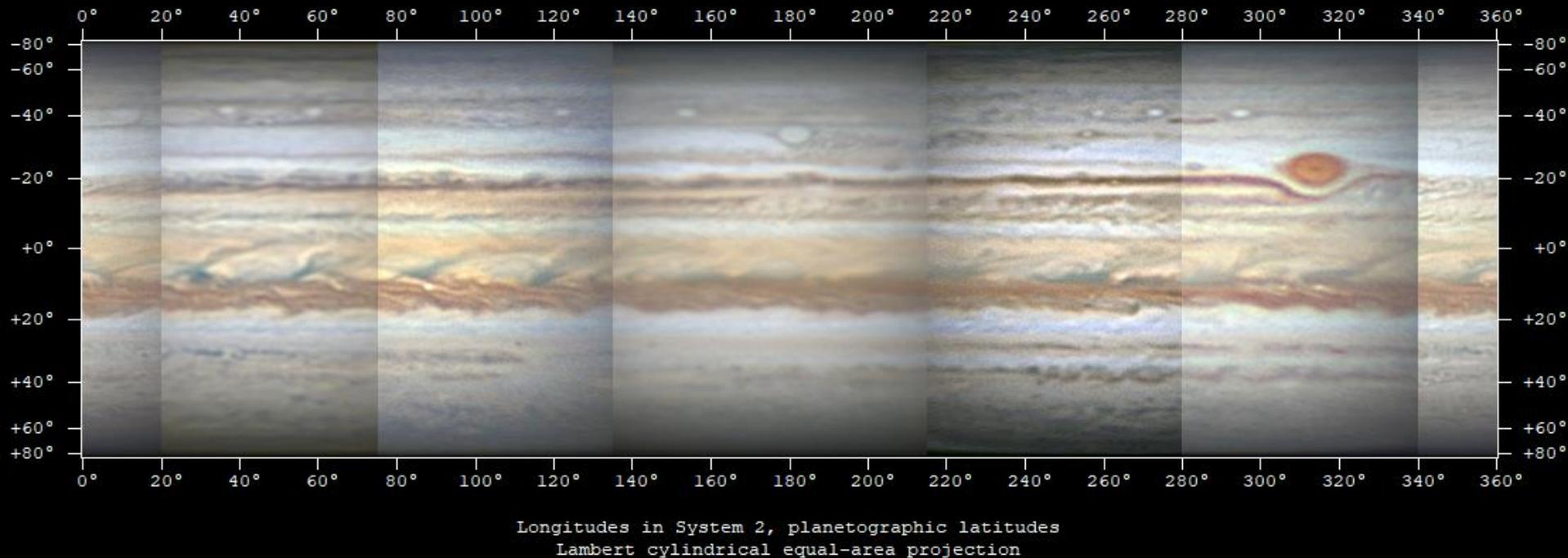


PJ21, JunoCam image 32

*Credit: NASA / SwRI / MSSS / John Rogers*

次のSEBsリング暗斑(7/31現在L2≐180,255°)がRS bayに到達するのは8月中・下旬？

Date	UT	Observer	Channel	Longitude	Sy.	Latitude
2019 Aug 01	11:26.1	M.Kuroda	Colour	20°... 75°	2	-90°...+90°
2019 Aug 01	12:24.0	T.Kumamori	Colour	75°...135°	2	-90°...+90°
2019 Jul 31	09:02.6	A.Casely	Colour	135°...215°	2	-90°...+90°
2019 Jul 31	11:32.0	H.Einaga	Colour	215°...280°	2	-90°...+90°
2019 Aug 01	18:01.6	C.Foster	Colour	280°...340°	2	-90°...+90°
2019 Aug 01	09:30.0	M.Wong	Colour	340°... 20°	2	-90°...+90°



準循環気流が消滅しているので、2019/1~2頃と同様に

- GRS後端でフレーク発生？ (RS bay後方への拡散を伴う)
- GRS後端から前端への波及はあっても小規模？
- GRS前方のSTrBは淡化

# END

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@月惑星研究会 ALPO-Japan