Jupiter's zonal winds in 2016 from PlanetCam and amateur observations

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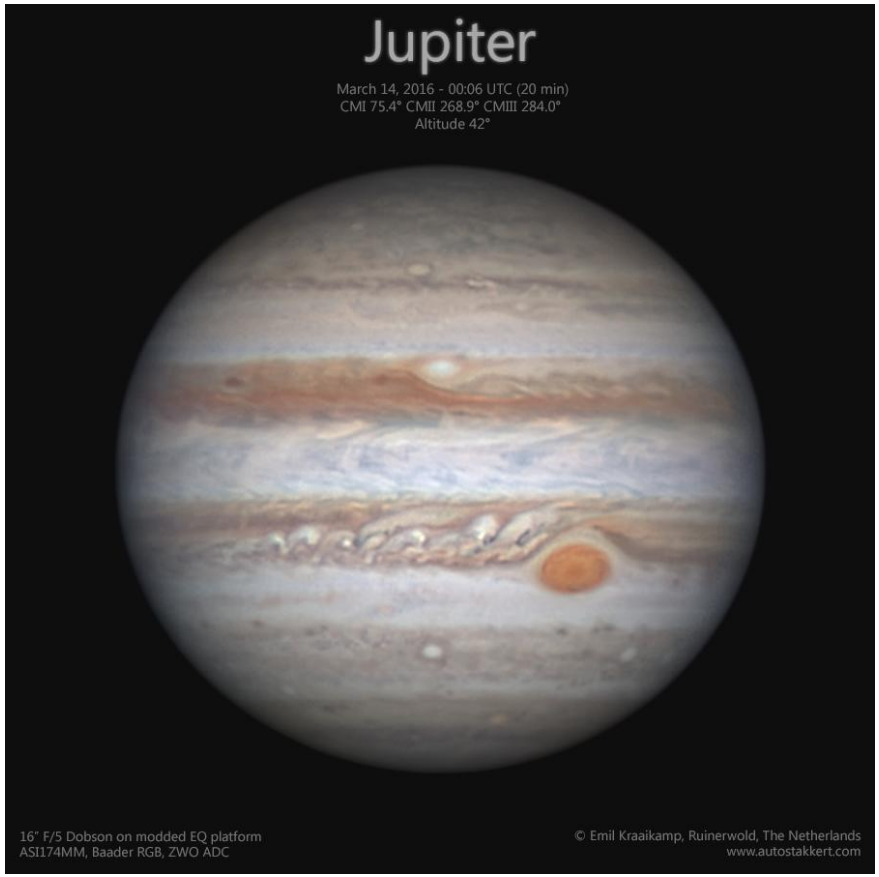
& PVOL and ALPO Japan contributors

Work in progress, started about 2 months ago



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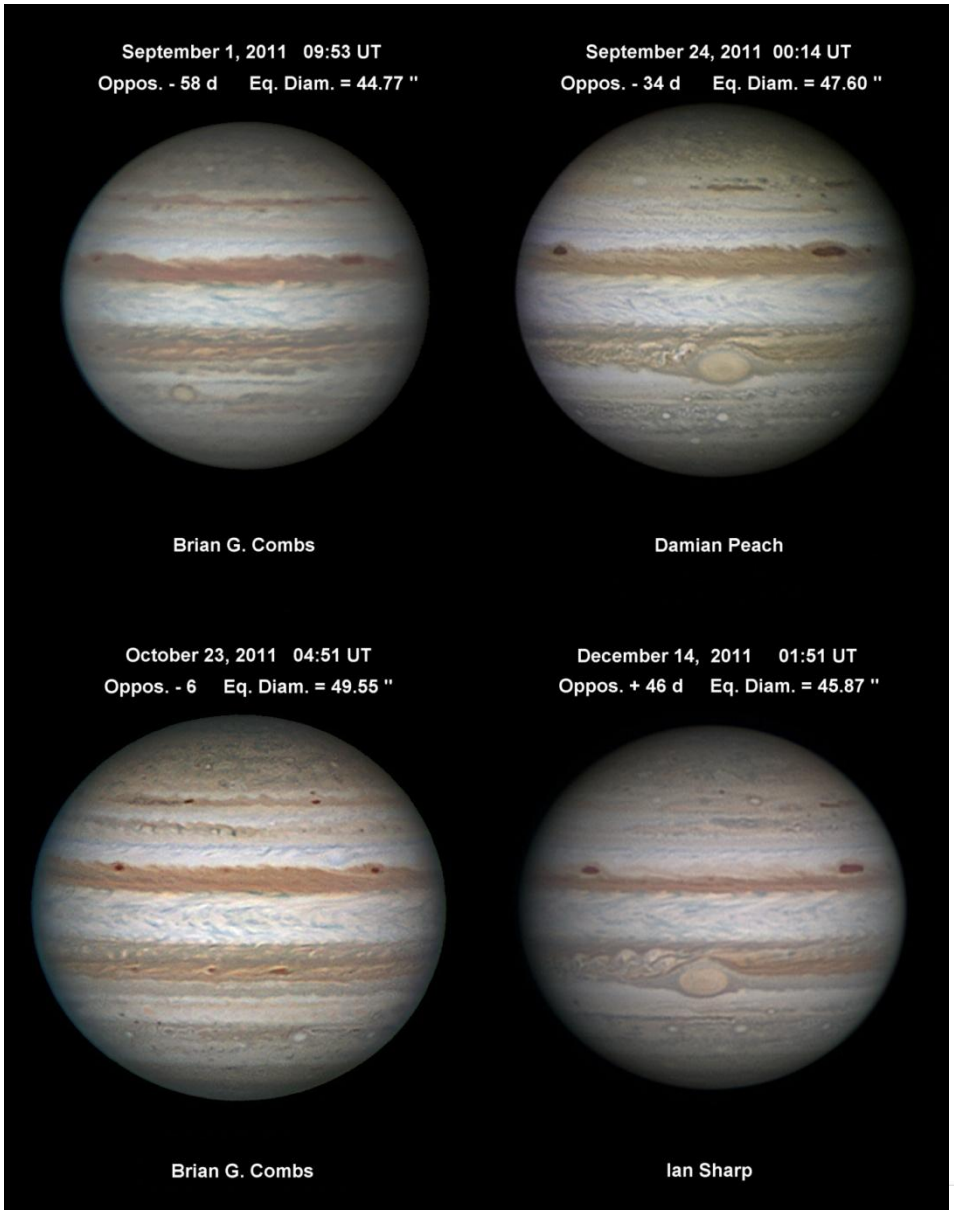
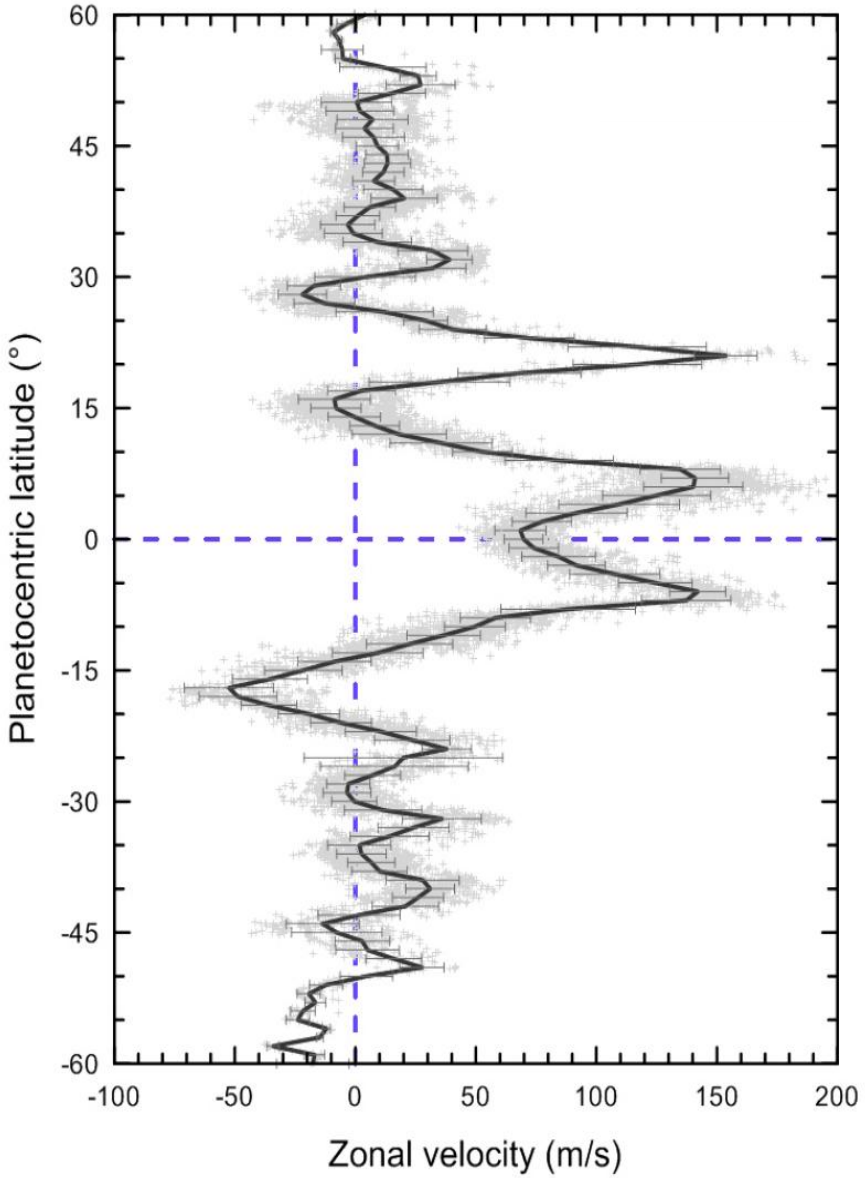
Grupo de Ciencias Planetarias
Zientzia Planetarioen Taldea

Jupiter's zonal winds from amateur images in 2011





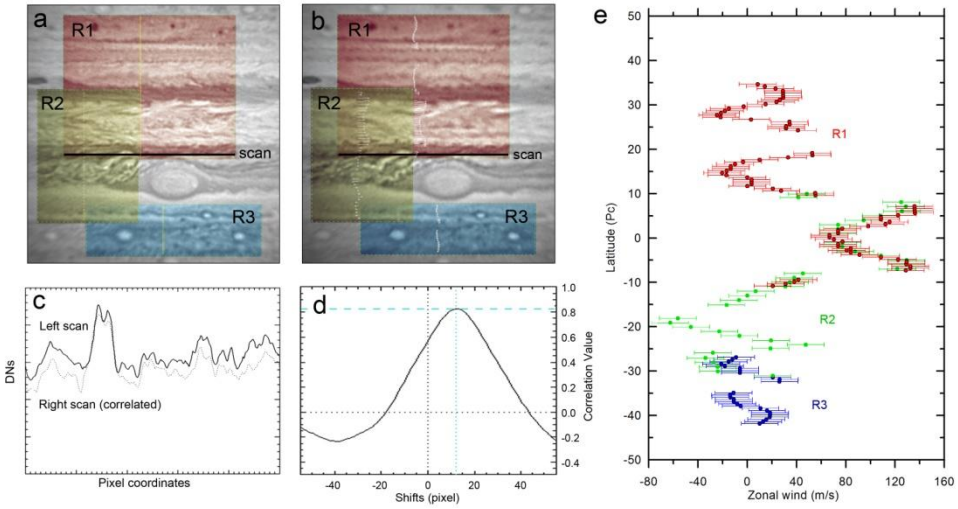
Barrado-Izagirre et al. A&A (2013)

Jupiter's zonal winds from amateur images in 2011

Methodology

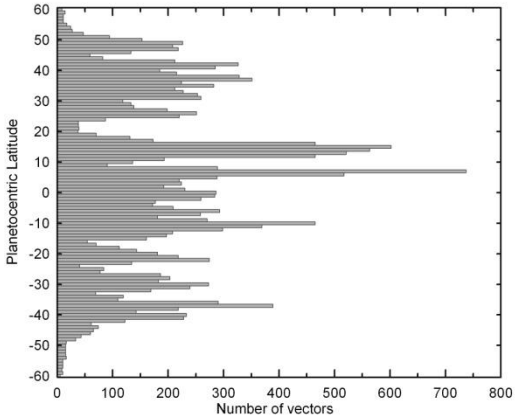
Correlation of zonal scans of cylindrical projections of the images.
Navigation with LAIA or WinJupos. Precise navigation is the key.
In 2011 images were not derotated simplifying time associated to each image.

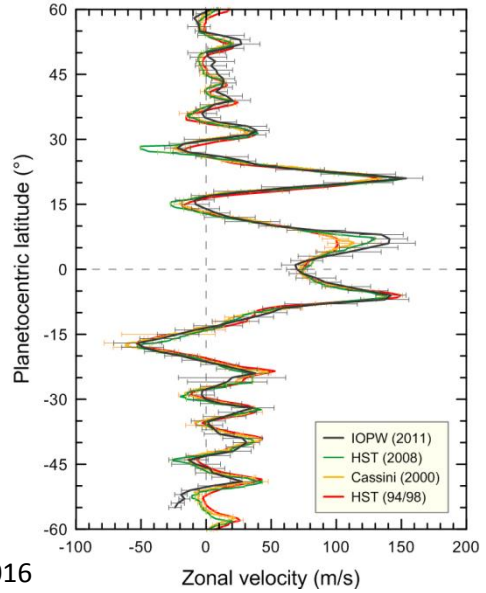
PICV2 Software (IDL based, written by R. Hueso)



Statistics

Jupiter opposition on October 29, 2011
23 image pairs from
September to December 2011





Science

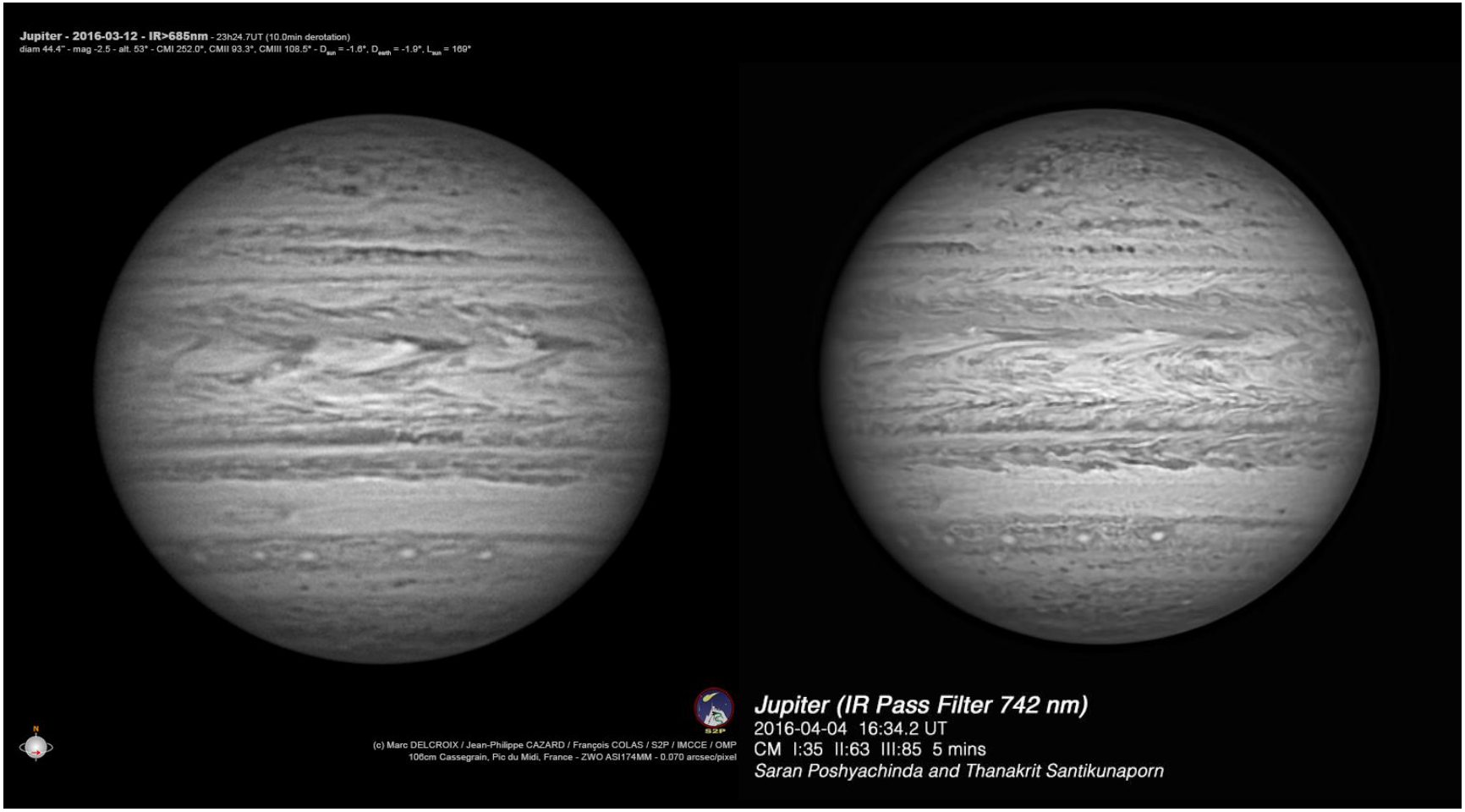
Science value comes from comparison of wind profiles on different epochs
Relation with morphology.
Interesting latitudes:
- NEB
- NTB
- High latitudes

Jupiter's zonal winds from amateur images in 2015-2016

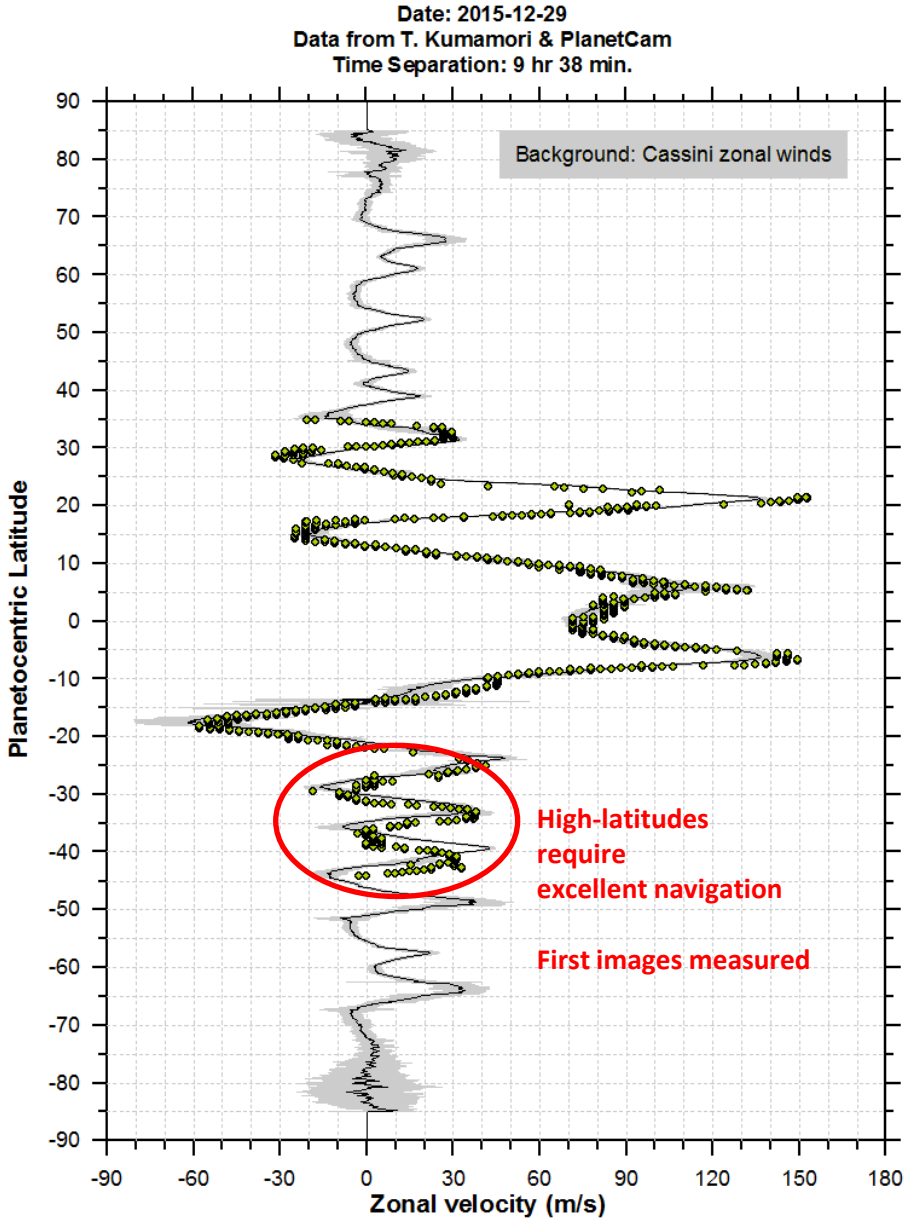
- Significant improvement in image quality and N# of high-quality images.
- Some excellent observations from 11'' to 14'' telescopes
- Image derotation (Good: Better images; Bad: Innacuracies in timing)
- Interest to characterize Jupiter's atmosphere before and during Juno

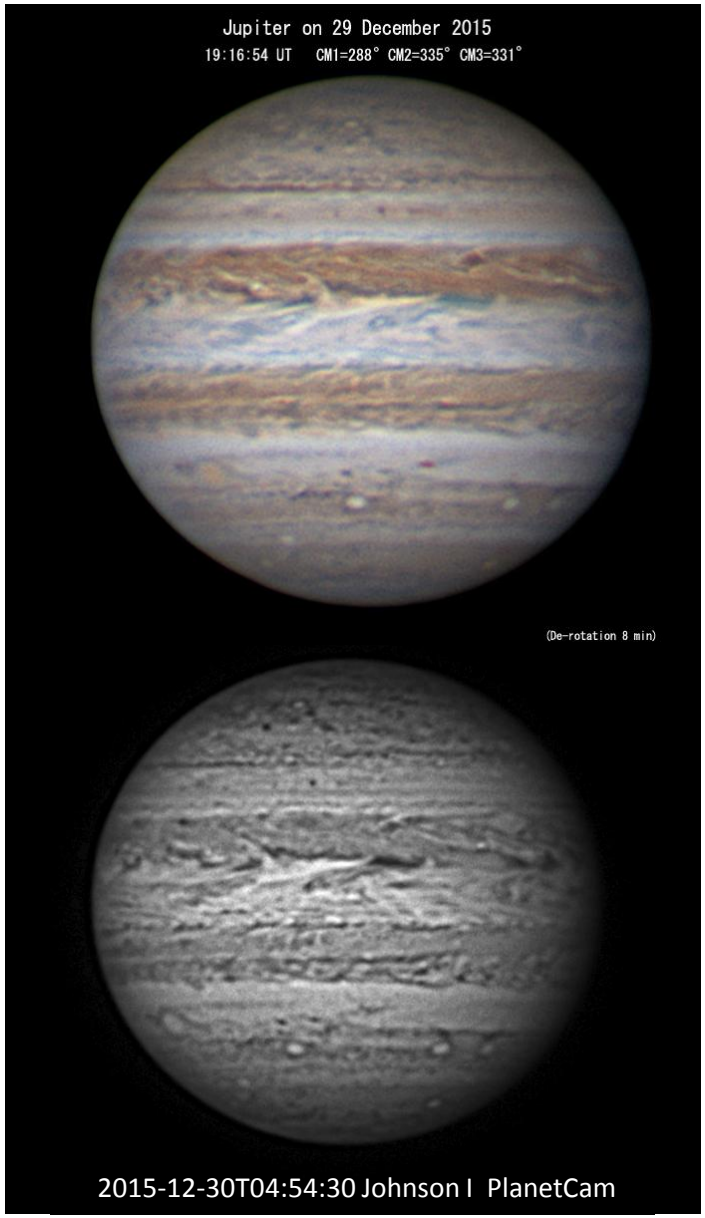
- Amateur data can be used in tandem with professional data standing very well the comparison

70 cm telescope in Thailand (robotic)
1.05 m Pic du Midi in France (excellent seeing)
2.2m PlanetCam in Spain + 14'' robotic telescope in Spain
2.2m in Thailand?

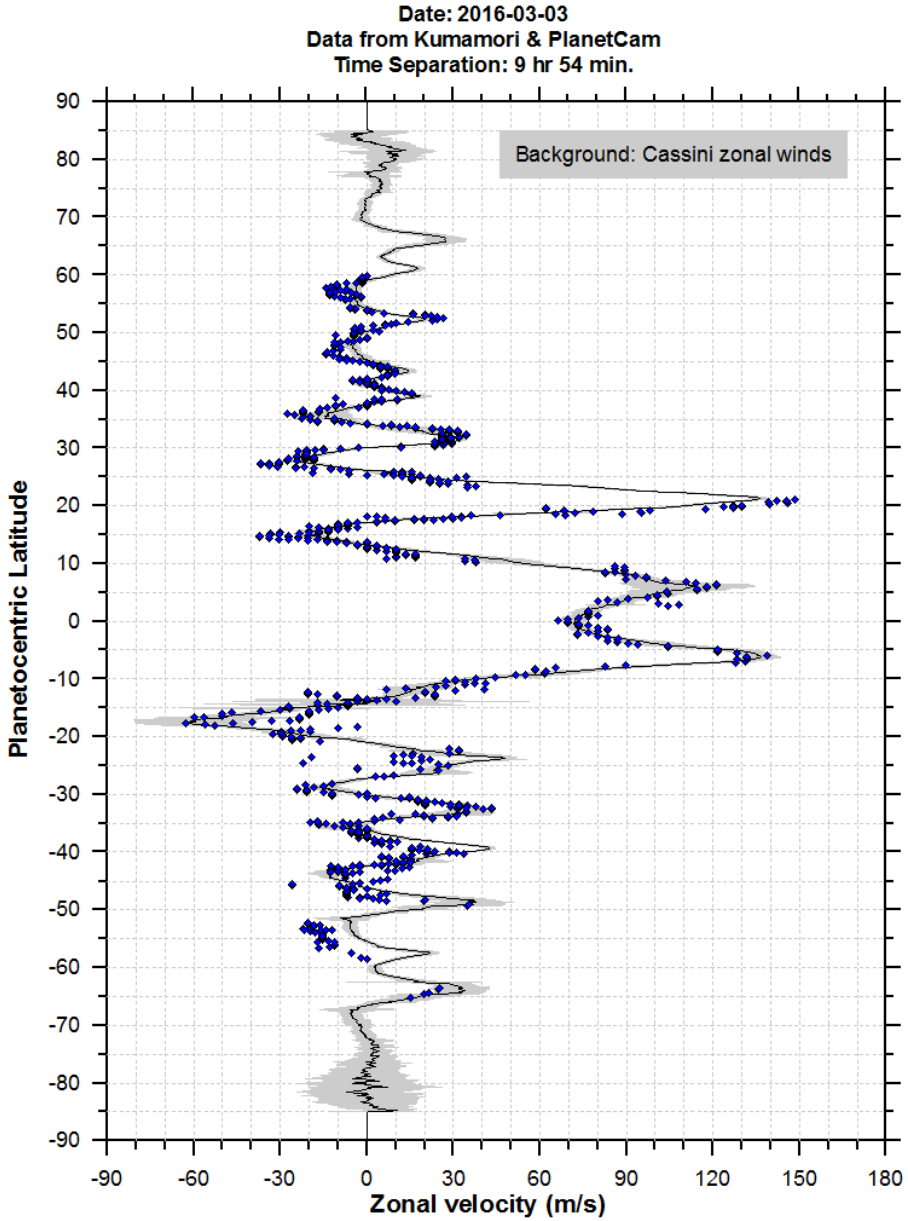


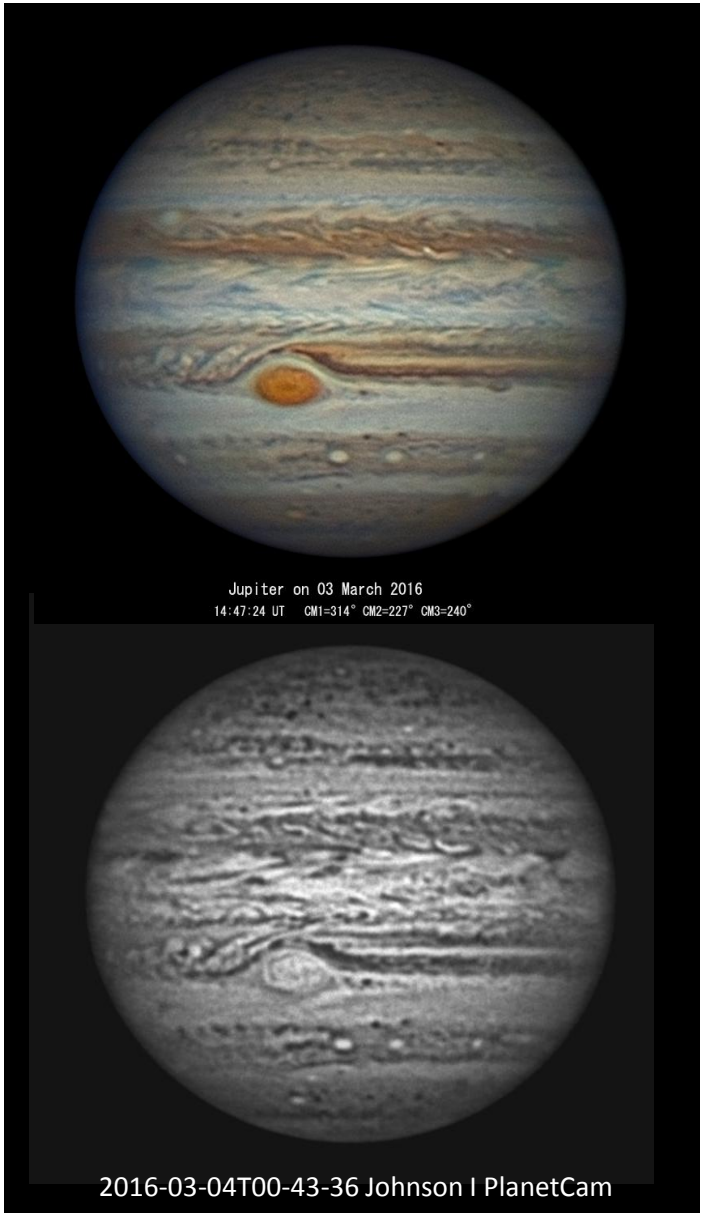
Jupiter's zonal winds from amateur images in 2015-2016





Jupiter’s zonal winds from amateur images in 2015-2016





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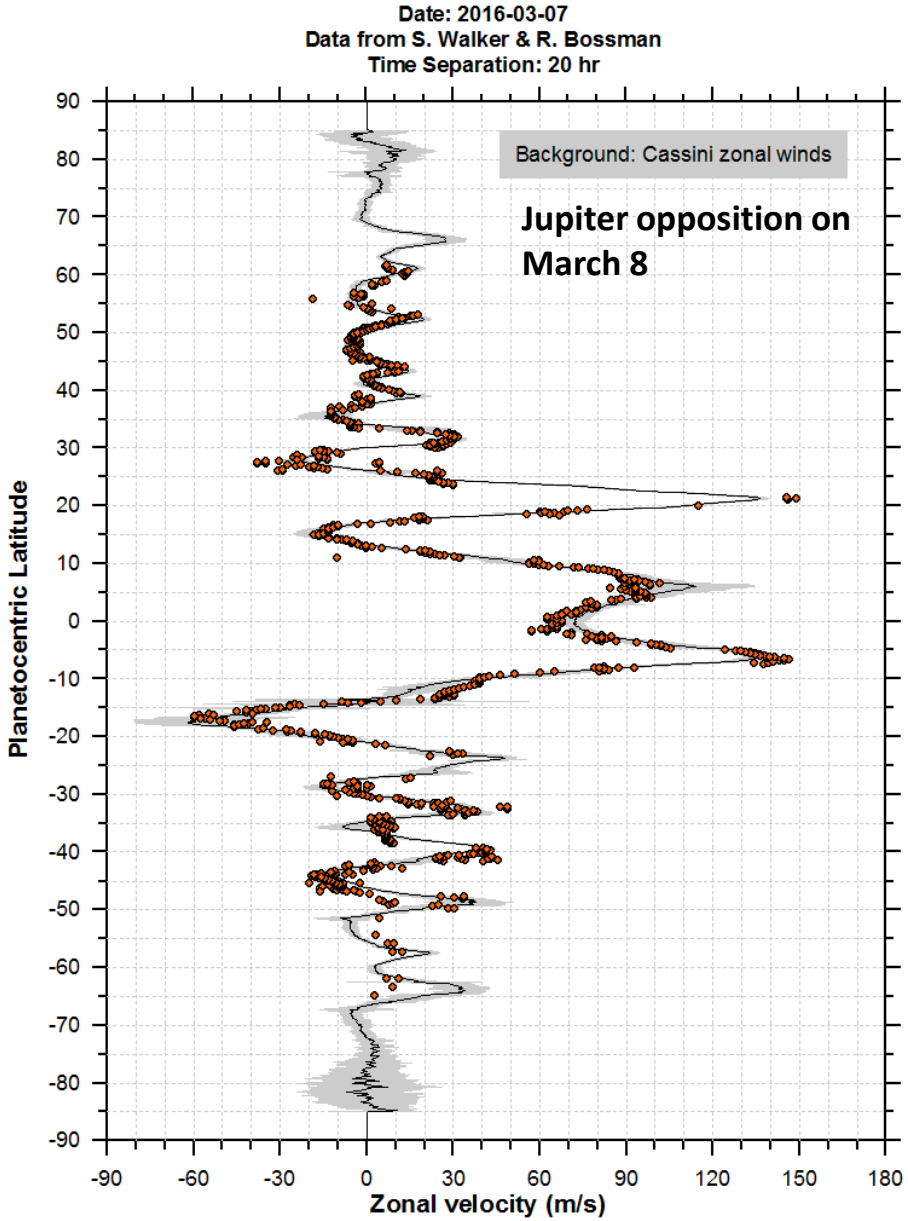

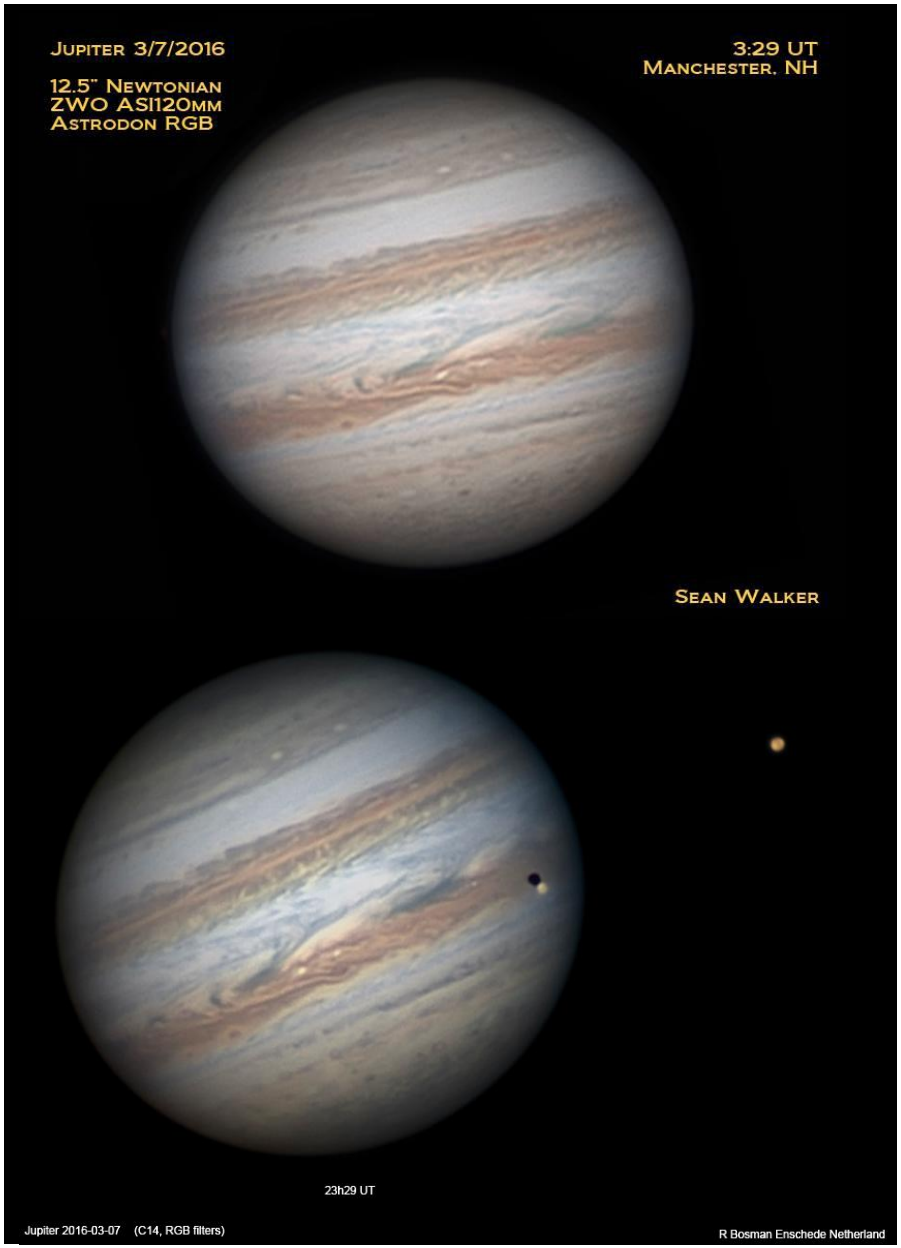

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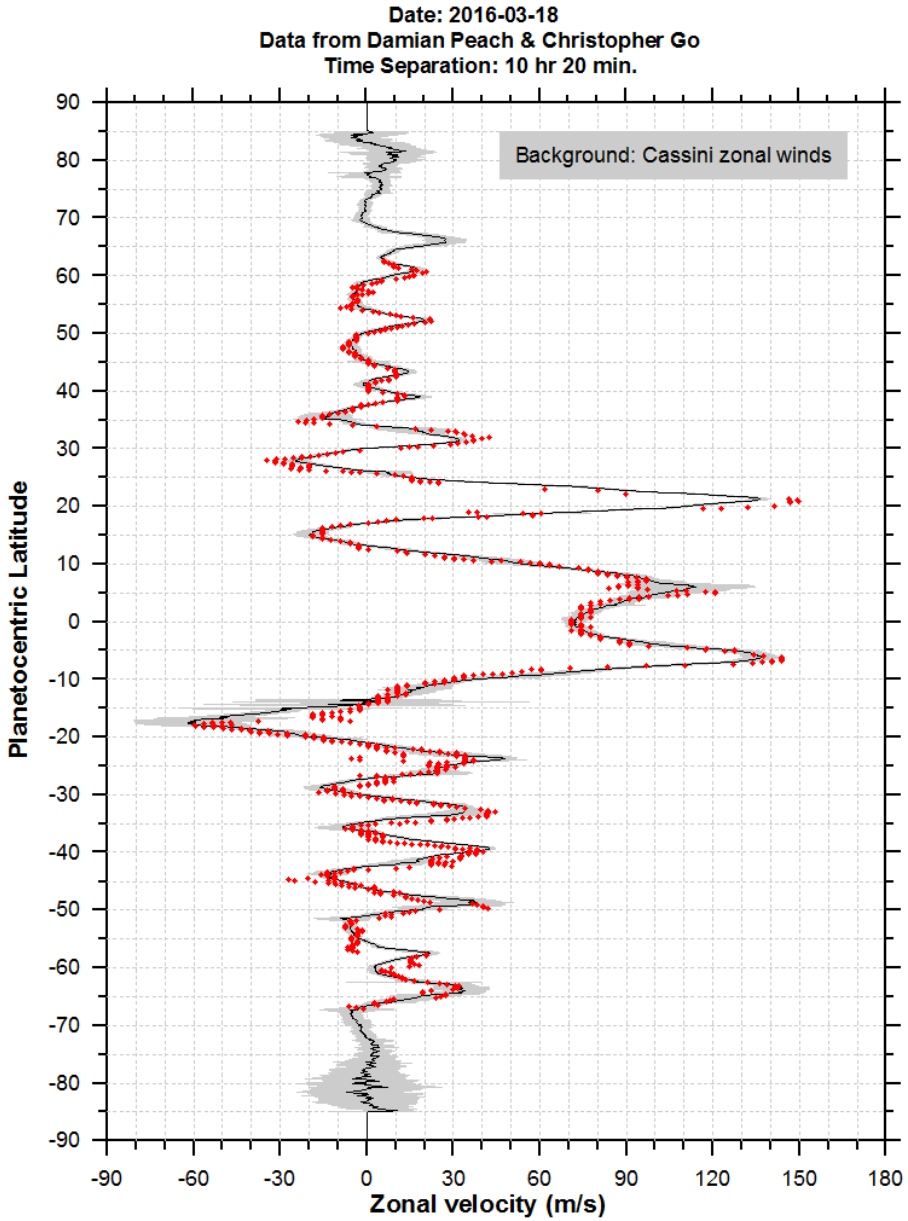
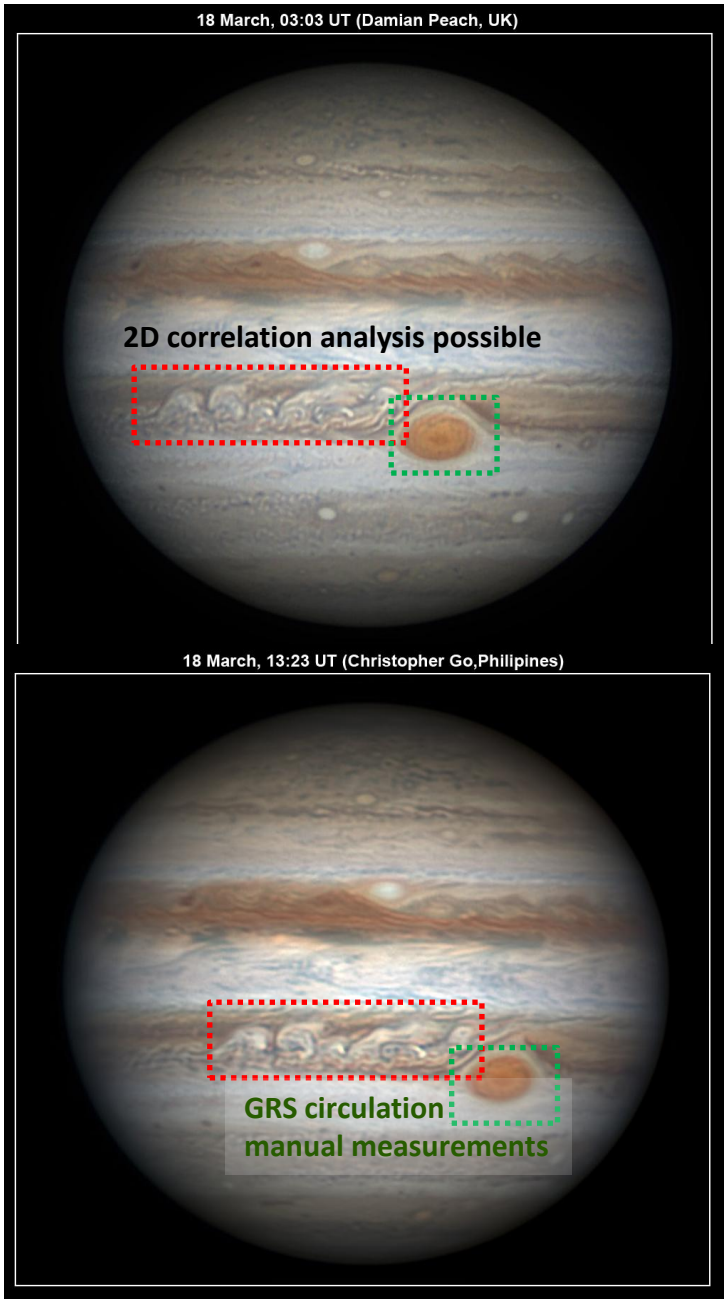


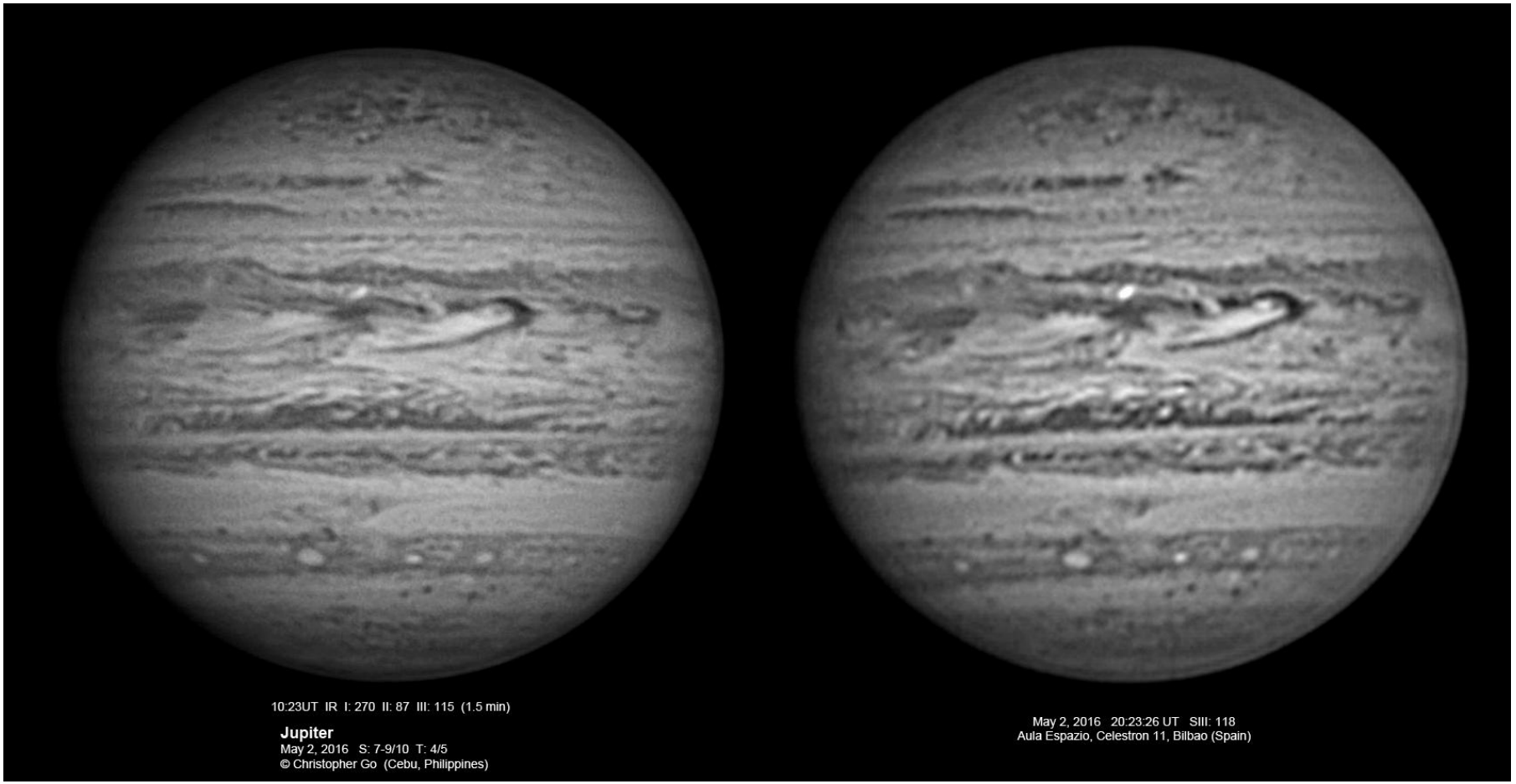


Jupiter's zonal winds from amateur images in 2015-2016

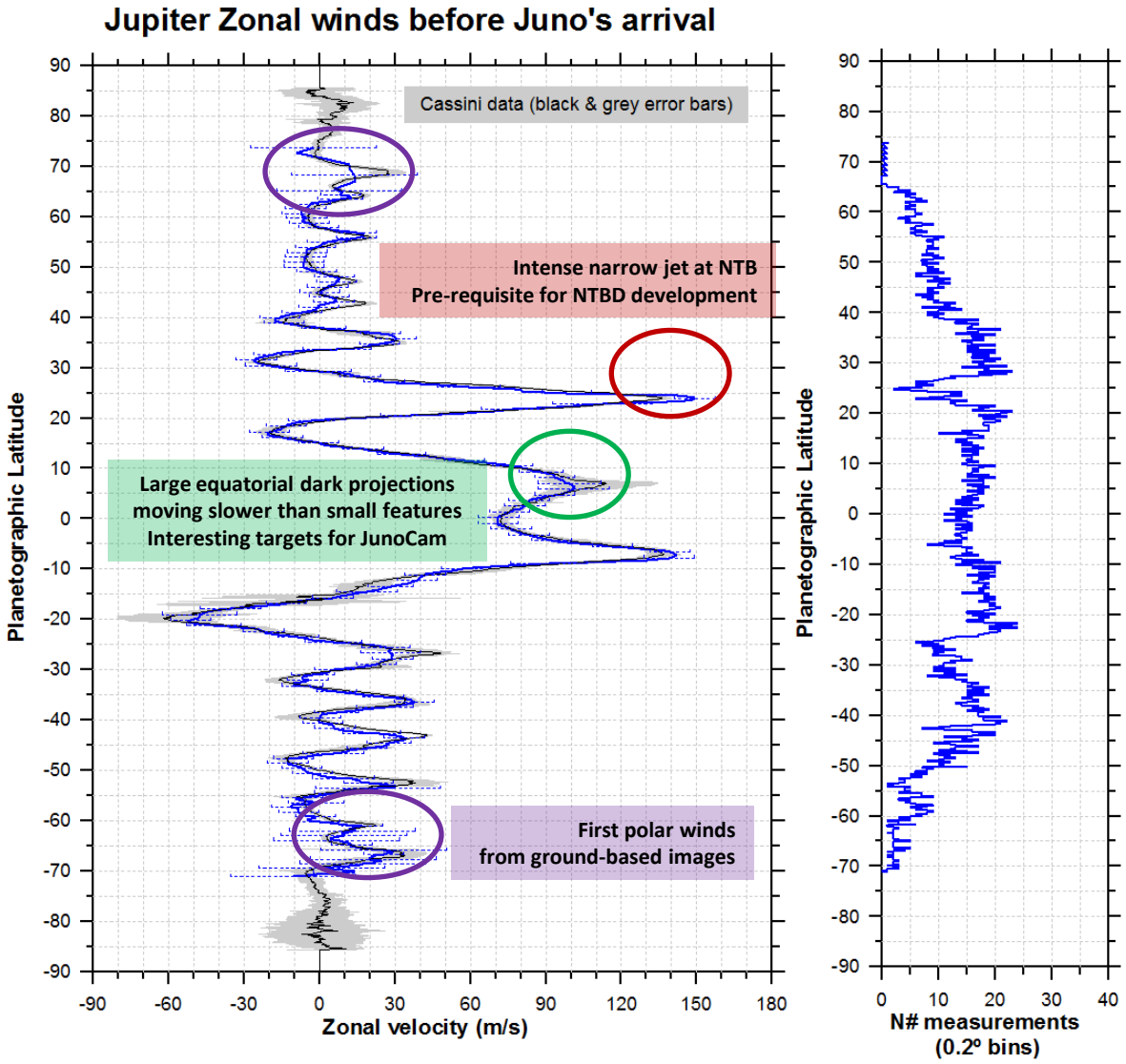
Dozens of image pairs waiting to be processed.

Lots of data from April and early May (better weather in Europe and USA).

Example: Image comparison from Christopher Go and Agustín Sánchez-Lavega (C11)



Jupiter's zonal winds from amateur images in 2015-2016



Data & Dates:

2015-12-29:	PlanetCam	- T. Kumamori	(9.7 hr)
2016-01-11:	C. Go	- C. Go	(48.6 hr)
2016-03-03:	T. Kumamori	- PlanetCam	(9.9 hr)
2016-03-07:	S. Walker	- R. Bossman	(20.0 hr)
2016-03-16:	K. Quin	- C. Go	(9.9 hr)
2016-03-18:	D. Peach	- C. Go	(10.3 hr)
2016-04-20:	R. Bosman	- T. Olivetti	(19.8 hr)

ESTIMATED ERROR BARS

At points with enough sampling
error bars display the standard deviation

At points sampled poorly:

Maximum error bar: 25.0 m/s
(at latitudes sampled only once or twice)

Much more data still to be analyzed!

> 25 image pairs suitable for this analysis

JUNO observations planning:

Apparent constant winds over December-April; broadly similar to the 2000 Cassini winds except at the NTB, turbulent wake NW of the GRS and NEB.