Observation Protocol for the occultation by Triton on October 5
Lucky Star. 2017-09-29

1) Predictions and websites with informations:

You can find prediction and information in those four websites:

http://www.iota-es.de/triton-05102017.html
http://astro.kretlow.de/?Solar-System---Occultations/Triton-Occultation-2017
http://stargazer.me.uk/call4obs/NextEvent.htm
http://lesia.obspm.fr/lucky-star/predictions/2017/Triton/html/2017-10-05-23h51m24s_Triton_GDR2_JPLnep081de435.html
https://www.cieletespace.fr/actualites/sondez-l-atmosphere-de-triton

2) Time of observation

The occultation will be visible (during the night from 5th to 6th October) between 23h44 and 23h52 **UT** depending of your location in Europe. In order to harmonize observations, **please record images between 23h37 and 00h00 UT**

3) Exposure time considerations

Be careful about the readout time (dead time) between images. USUALLY, we ask that the exposure time be at least the value of the dead time (for example if the dead time is around 1.5s, exposure time should be 1.5s or 2s). This allow us not to lose more than 50% of information.

BUT things are different with a smooth atmospheric occultation: not so much information is lost if dead times are larger than exposure times. **In practice, you should not have exposure times larger than ~2 sec (SNR permitting)**. Otherwise complicated effects arise, due to the convolution of the large exposure time with the stellar flux variations due to Triton's atmosphere.

4) Field of view

A reference star is essential for reconstructing the occultations light curve, see http://www.iota-es.de/triton-05102017.html for a choice of possible reference stars. The best ones being those that are comparable to or slightly brighter than the Triton+occulted star, ie in the the range R=10-12.
If the field of view is too small, a possibility is not to saturate Neptune in order to use it as reference. But Neptune IS bright! (R~8.2). The use of a I or R filter could help as Neptune is brighter in blue, see magnitudes in http://www.iota-es.de/triton-05102017.html

Full Moon will probably be a problem. Do not hesitate to use a "Moon Shade" (cardbox or tissue) in order to avoid/limit direct illuminating on mirror or other part of telescope.

5) Calibrations images : VERY IMPORTANT

Dark, flat and dark flat images must be recorded. If you have difficulties, however, the priority is to get darks over flats, as flats usually bring less improvements to the photometric quality.

Calibration images must be recorded with same set up than occultation when Triton and the occulted star are far enough to measure the star flux without Triton's. This record must be made at same elevation than the occultation to preserve the flux ratio of various stars with different colors, due to differential extinction.
The two days before, Moon will be a problem, but **on October 5 between 18h and 20h UT (twilight) the configuration should be ok. So please record 10 minutes of images during this period using same set up (FOV, exposure time…) than during the occultation. If not possible, images should be taken nights after when the star is at same elevation.**
Elevation of objects can be obtained here : http://catserver.ing.iac.es/staralt/index.php

6) For Raptor Merlin and Watec users

For Raptor Merlin camera users, do not forget to run the GPS and synchronize it at the beginning and the end of the recorded sequence and deliver the GPS log file together with the images.

For Watec users, please use a linear gamma.

7) Time synchronization

For observers without GPS-based systems, you should keep the Windows PC time synced with UTC using Windows Internet Time (also known as NTP). As reference, the instructions for Windows 7 is found here:
http://mintywhite.com/windows-7/7maintenance/windows-seven-7-sync-system-clock-with-internet-time-how-to/
The use of a software such as Dimension 4 is more recommendable. If you use Dimension 4, activate the log and send it back together with the rest of the data.
http://www.thinkman.com/dimension4/

Thank you for your participation!

If you have questions, do not hesitate to contact Diane BERARD (diane.berard@obspm.fr) , Bruno SICARDY (bruno.sicardy@obspm.fr), Erick MEZA (erick.meza@obspm.fr).