



## How a 'miss' turns into a 'positive'

*Delayed success for 1036 Ganymed with TYC 3670-00426-1 – 2011-09-25*

Presentation at ESOP/32 – Barcelona 2013

*by*

*Harrie Rutten*

*DOA – IOTA\_ES*



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**When you have a miss:**

**Don't be mad at the person  
who made the prediction.**

**He did his best!!**



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Be disappointed but  
report a 'miss', always!

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Also a 'miss' is an important and valuable observation!



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## Why reanalyse the observation

of

## 1036 Ganymed with TYC 3670-00426-1

## after 1.5 years?



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## Contents:

- Eye Opening Analysis (Egeria 2013-03-26)
- Prediction Event
- The Observation
- The Early Analyses
- First Results
- New Analysis
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- Concluding remarks



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## Eye Opening Observation and Analysis

Difficulties with the analysis of the observation of 13 Egeria on March 26 2013



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## Eye Opening Observation and Analysis

**Difficulties with the analysis of the observation of 13 Egeria on March 26 2013**

- Drop only 0,5 magnitude
- Problem was: Interference in the video capture
- Analysis: problem to find a good csv file with Limovie





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## Eye Opening Observation and Analysis

Difficulties with the analysis of the observation of 13 Egeria on March 26 2013

- Drop only 0,5 magnitude
- Problem was: Interference in the video capture
- Analysis: problem to find a good csv file with Limovie

Result: **NEW EXPERIENCES!**



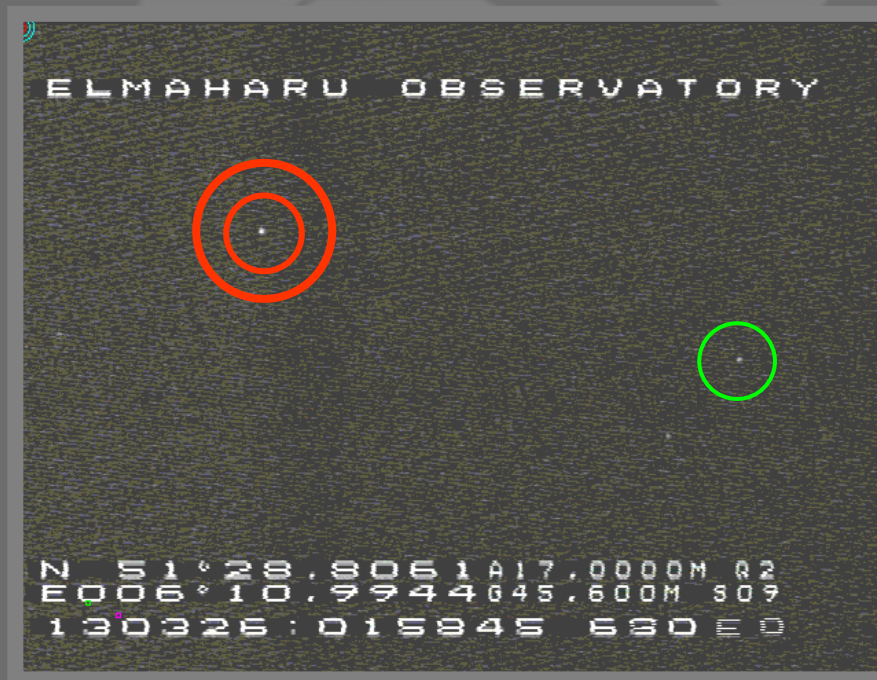
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## The Eye Opening Event



Before the occultation



During the occultation

Occultation GSC 2985 916 by 13 Egeria

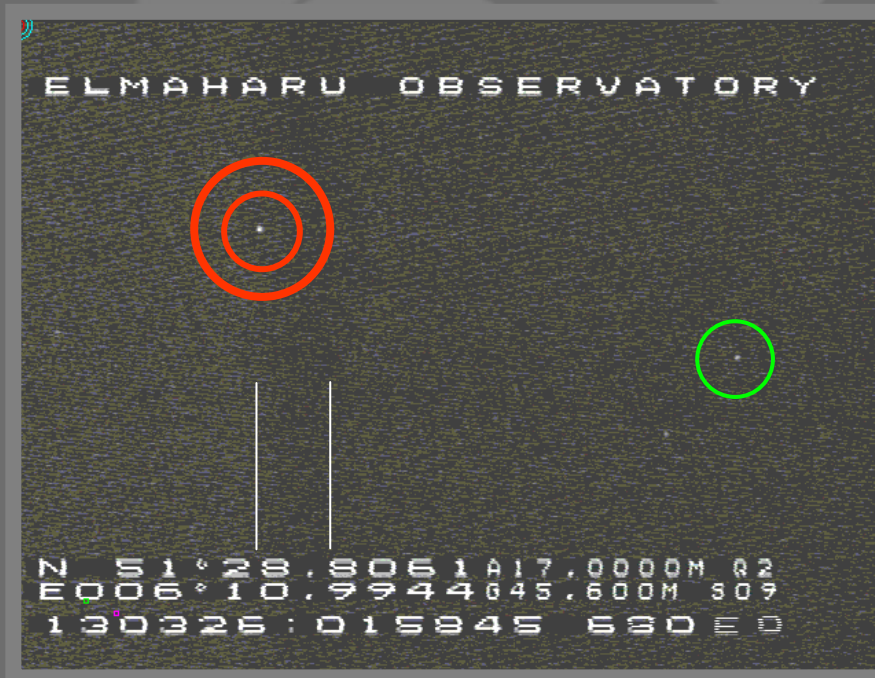


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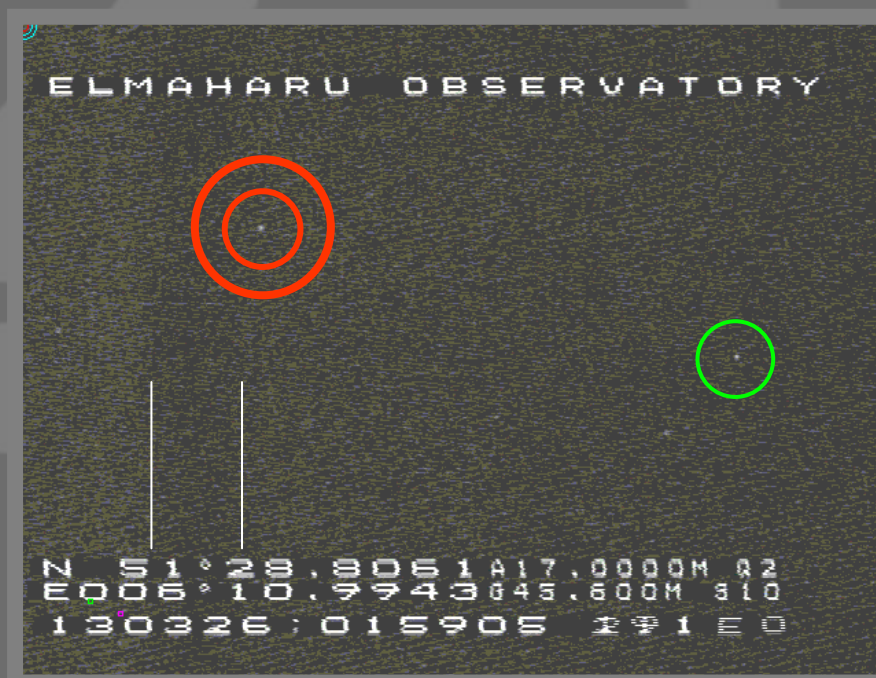
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Before the occultation



During the occultation

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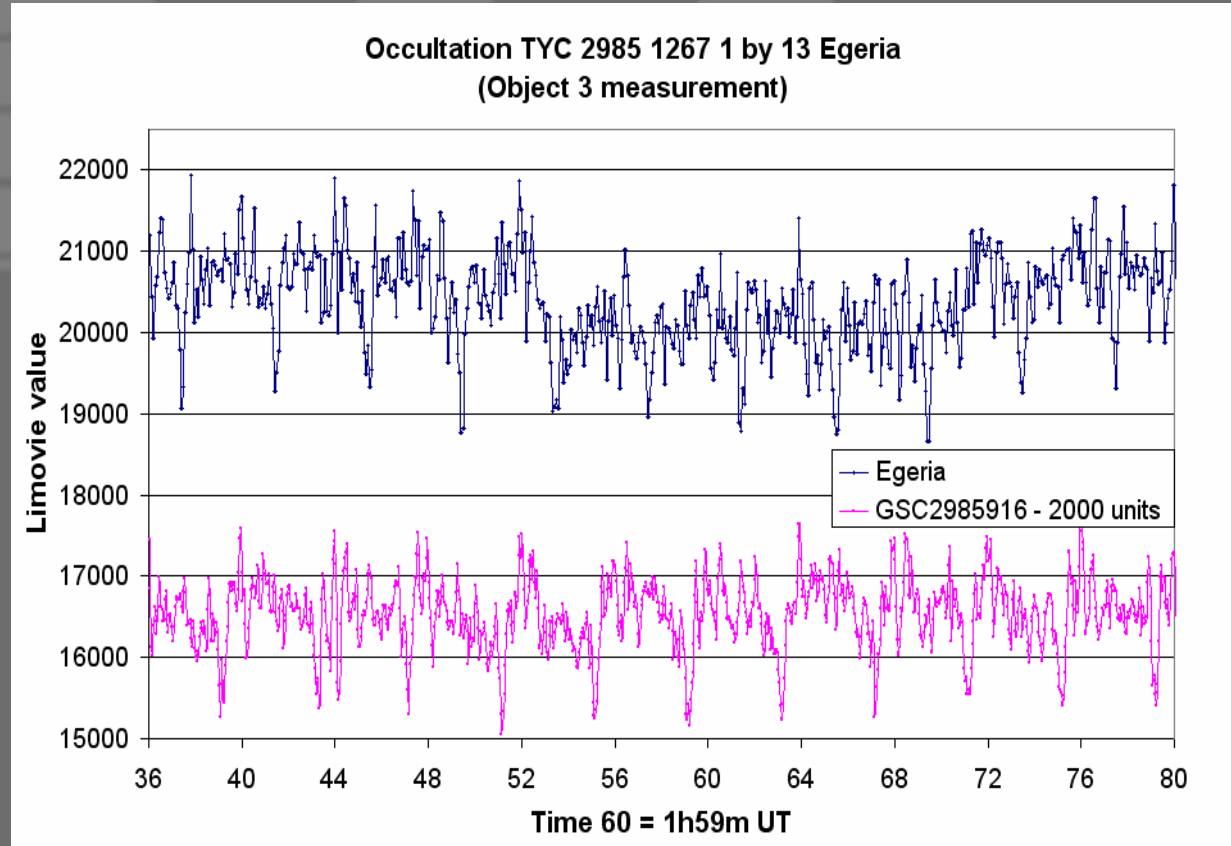


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Limovie digitalization by too large ROI



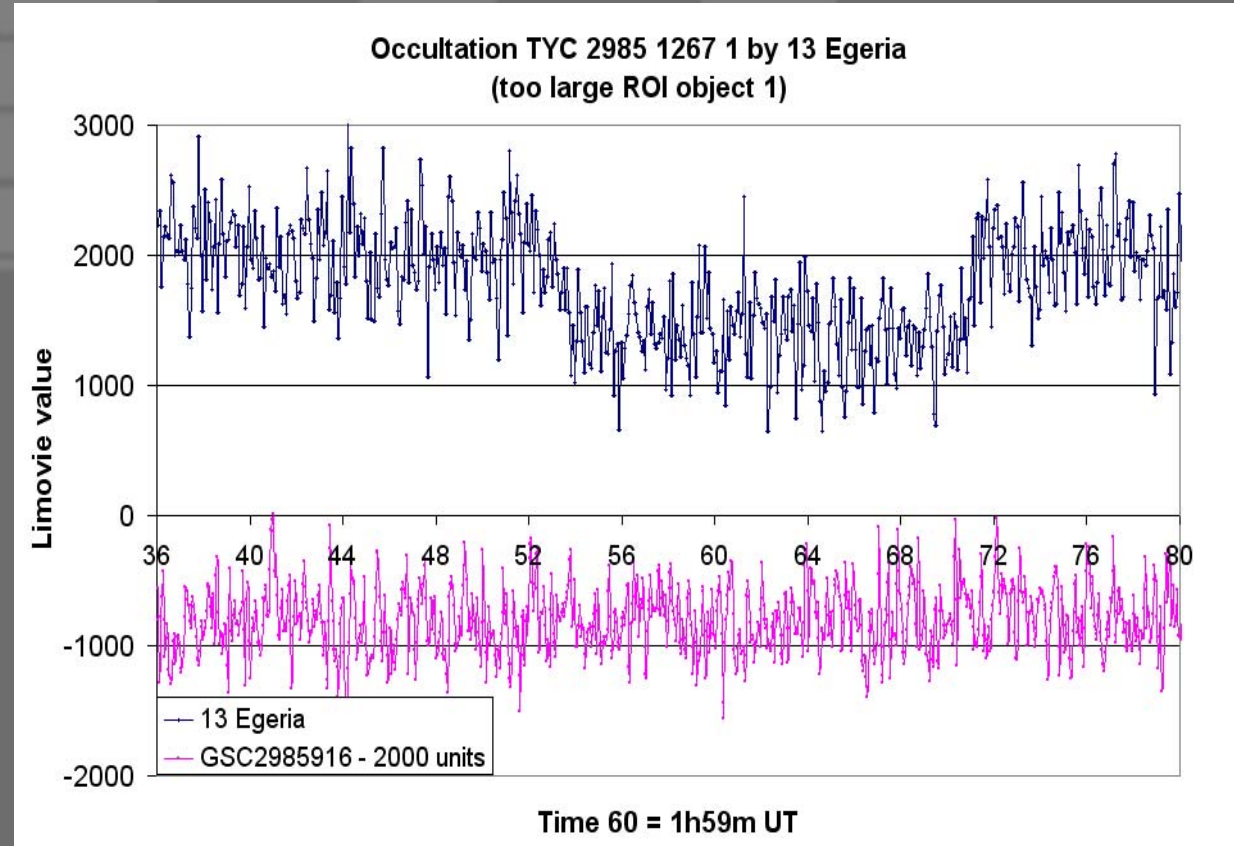


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Limovie digitalization ROI still too large

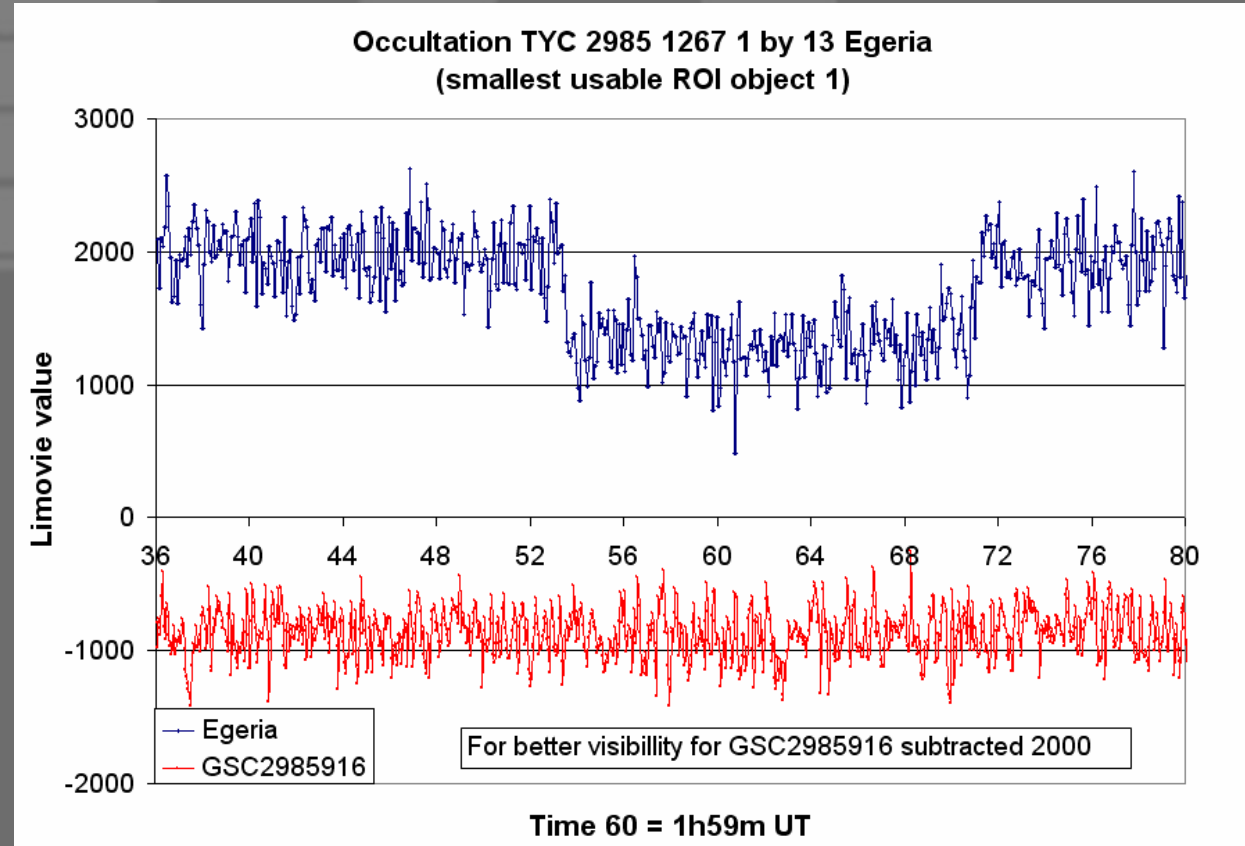


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Limovie digitalization smallest possible ROI



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## Now to the reanalysis of the Ganymed event

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The prediction

# LOST!





H  
De

Archived: _____	<b>Prediction and Observation notes</b>	Result: _____
<b>Asteroidal Occultation</b>		

**Elmaharu Observatory I – 51°28'48.3"N – 6°10'59.6"E – alt 16m (WGS84)**

Event date	_____ - _____ - 20_____
Predicted time	_____ h _____ m _____ s UT
Time Error  Maximum Duration	_____ s   _____ s
Proposal Recording: Start   End	_____ h _____ m _____ s UT   _____ h _____ m _____ s UT
Star	_____   mv = _____ mr = _____
Position RA   Position Dec   Alt / Az	_____ h _____ m _____ s   _____ ° _____ ' _____ " N/S   _____ ° / _____ °
(MPC #) Asteroid   NEO   Object	(_____ )   mv = _____
Minor Planet Visible	No   Yes
Magnitude Drop   Visible?	_____ m   Yes   Probable   No
Moon Dist - Illum - Alt Sun Alt Dusk	_____ ° - _____ % M _____ °   s _____ °   Day Ck Nat Asto _____
Path width   Distance to center	_____ km   _____ km   Inside   Outside path
Probability: 1-Sigma   %   Graphics	_____ km   _____ %   c _____ E _____ I _____ 2.3...
Last update by	_____ - 20_____ / _____ h _____ m _____ s UT BY _____
Telescope	Meade 14"   ODK 16"   Other: _____
Reducer Extender	Optec 0.3   AME 0.5   Other: _____
Focal length	Original _____ mm   Reduced _____ mm
Camera	Watec 120N   Watec 120N+   Mintron   Luminera
Chipsize   Field °' (Screen)	_____ mm X _____ mm   _____ X _____
Integration Time	OFF   1   2   4   8   16   32   64   128   256 # 0.02   0.04   0.08   0.16   0.32   0.64   1.28   2.56   5.12   10.24 sec -0.04   -0.05   -0.07   -0.11   -0.19   -0.35   -0.67   -1.31   -2.59   -5.15 sec
Gain 1	0..0.5..1.0..1.5..2.0..2.5..3.0..3.5..4.5..5.0..5.5..6.0..6.5..7.0..7.5..MAX
Gain 2	OFF   LO   HI
Video Time Inserter	Anderson   Cuno   Kwi   _____
Time Keeping	GPS   DCF   ACH77   _____
Real Recording: Start   End	_____ h _____ m _____ s UT   _____ h _____ m _____ s UT
<b>RESULT</b>	Positive   Negative   Uncertain
Disappearance   Accuracy	_____ h _____ m _____ s UT   + _____ s   - _____ s
Reappearance   Accuracy	_____ h _____ m _____ s UT   + _____ s   - _____ s
Mid Event   Accuracy	_____ h _____ m _____ s UT   + _____ s   - _____ s
<b>File RECORD</b>	_____
Atmospheric Transparency	Bad   Moderate   Good   Very Good   Excellent
Wind	None   Little   Moderate   Strong   Very Strong
Weather comment	-   (Many) Clouds   Fog   Humid sky illuminated by Moon
Star Image Stability	Bad   Moderate   Good   Very Good   Excellent
Lim. Vis. Mag.   Temp.   Hum.	m-LIMIT y = _____   _____ °C   _____ % RH
<b>File REPORT</b>	_____
Observer	_____ <i>Harrie G. J. Rutten</i>
Other Remarks: Also at back side	_____
GPS " actual : La: _____ Lo: _____	_____

2011-09-25

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## Prediction and Observation Notes

The prediction includes:

- this cover sheet
- world chart of the path
- OW observers chart(s)
- starfield with camera frame

After observation:

- avi file
- csv file
- graph
- article for Occultus

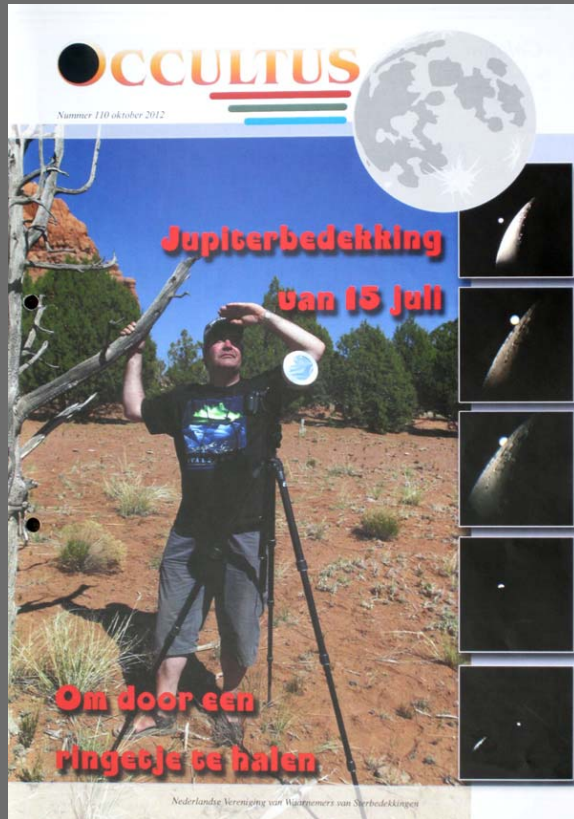


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**OCCULTUS**, the quaterly magazine of DOA



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## The Observation



Before the occultation



During the occultation

Video frames of Ganymed event

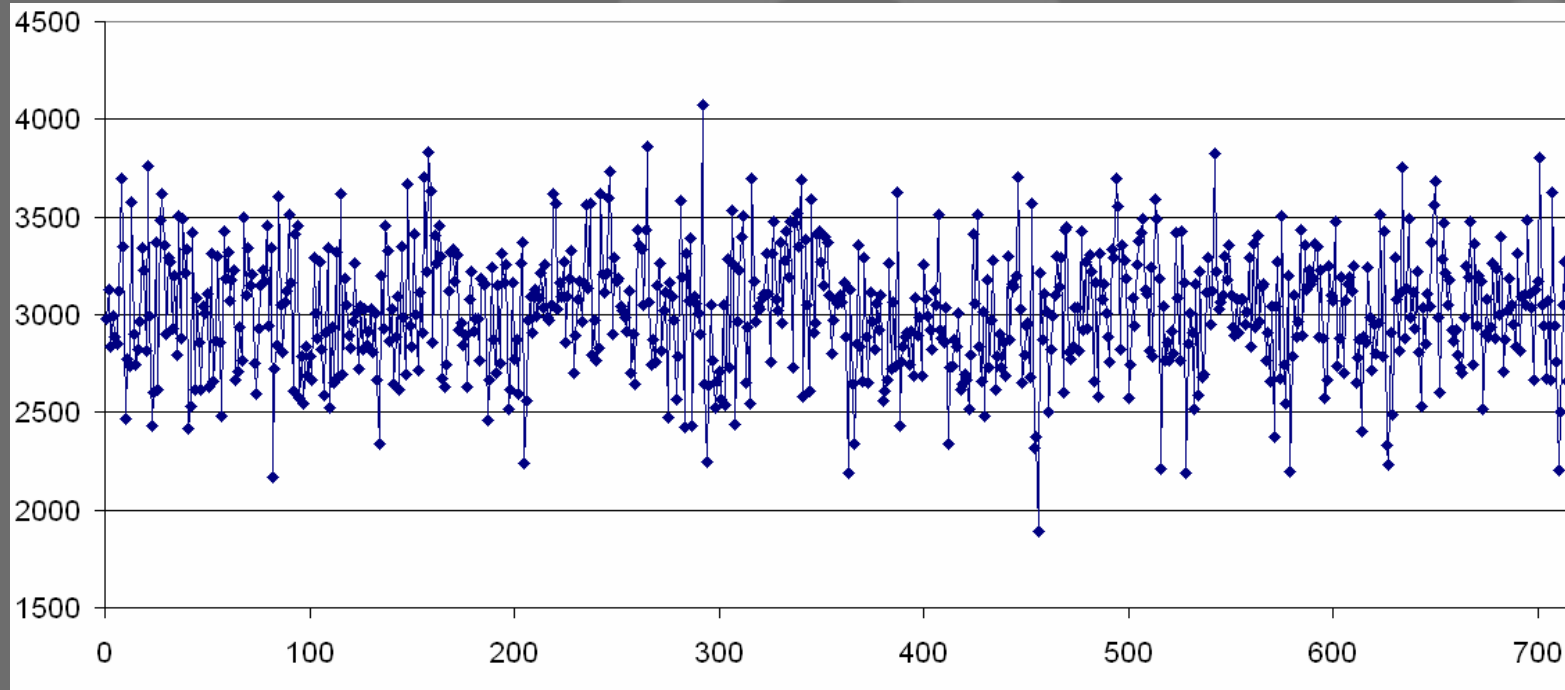


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**Graphical display of the csv-file from Limovie  
'the day after' the occultation  
(too little experience with Limovie)**

**Where is the occultation?**

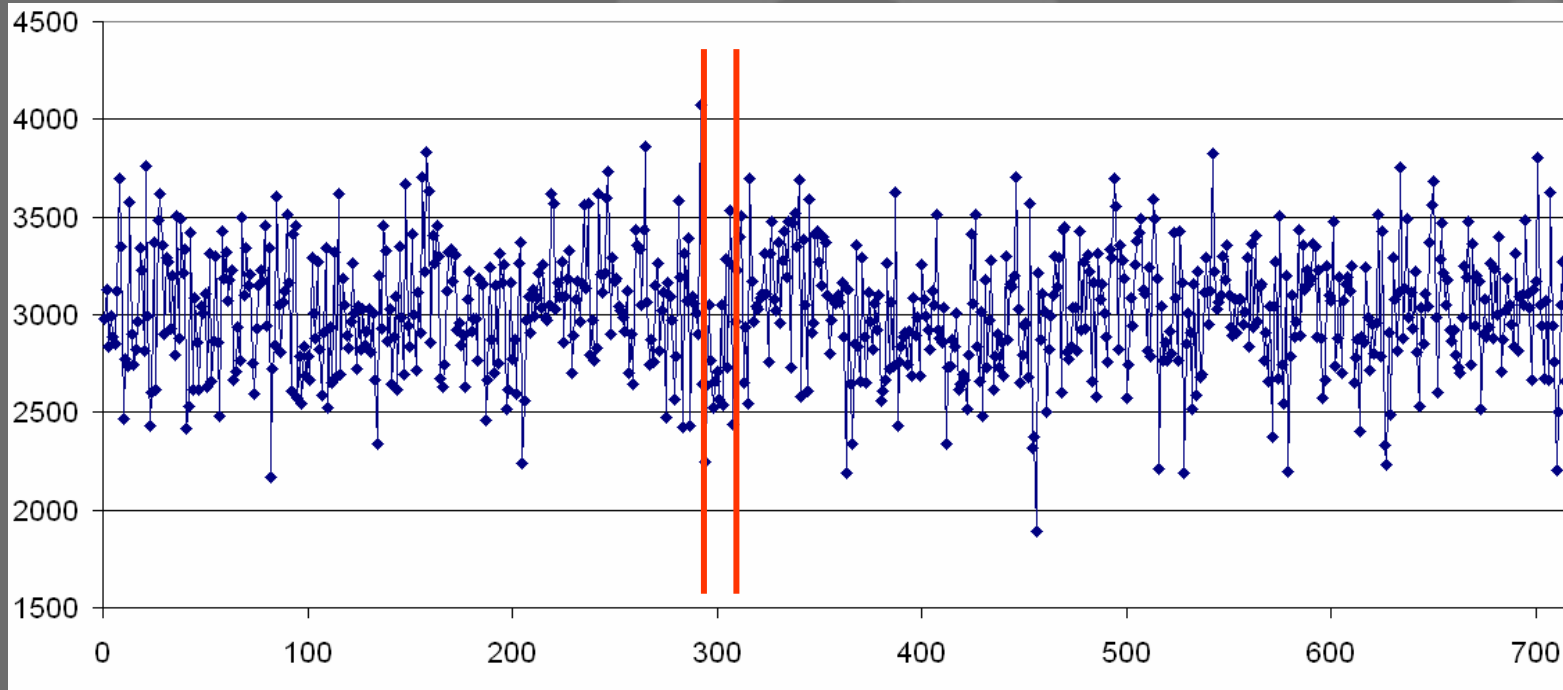


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To my opinion that was the occultation

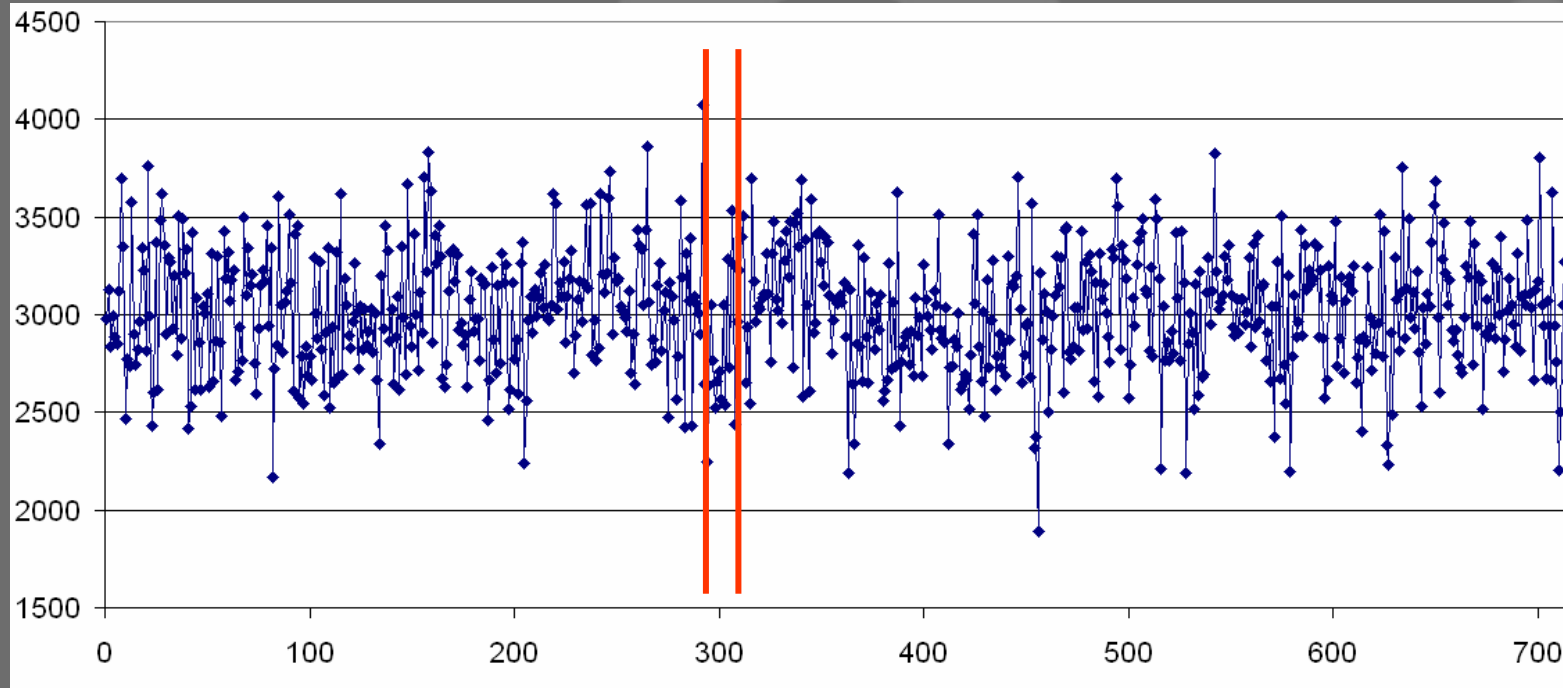


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but:

I was not sure, sent the file to:

Eric Frappa

Wolfgang Rothe

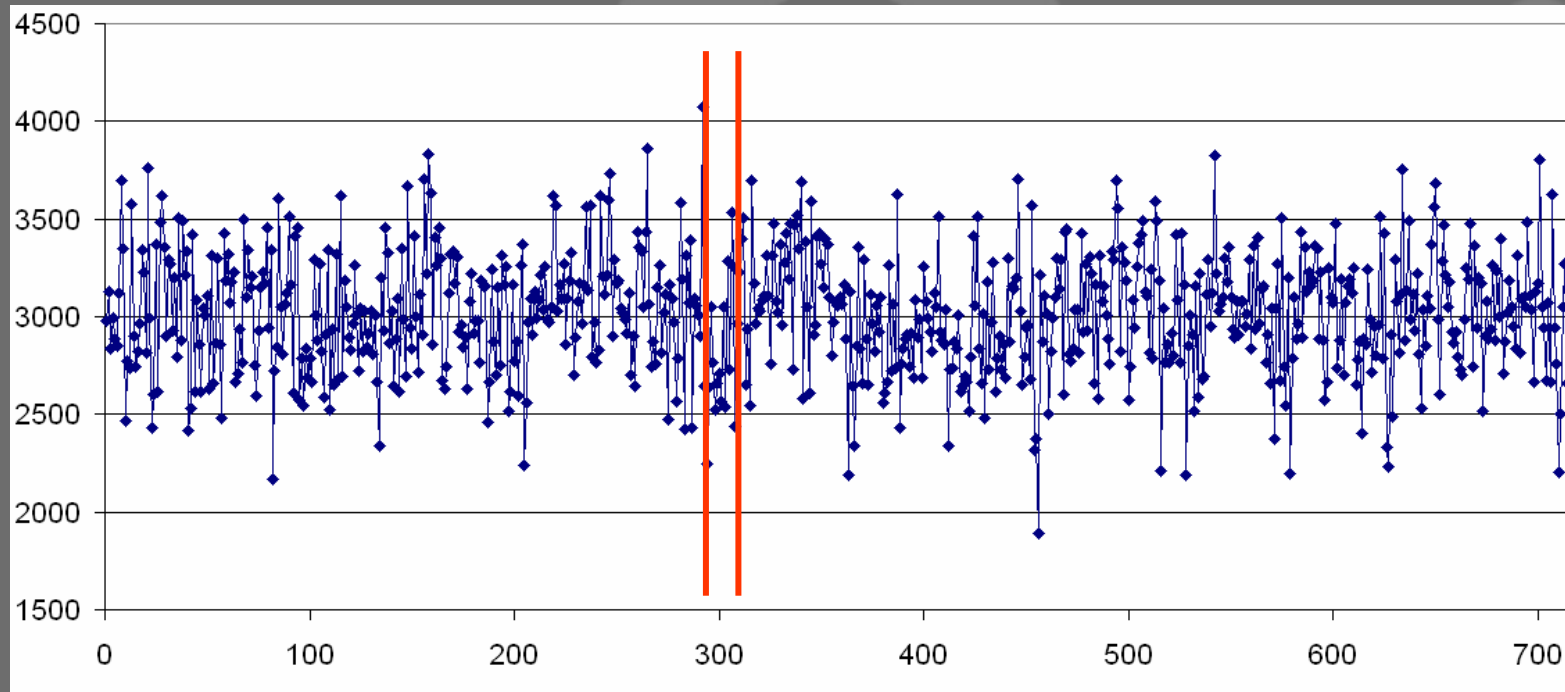


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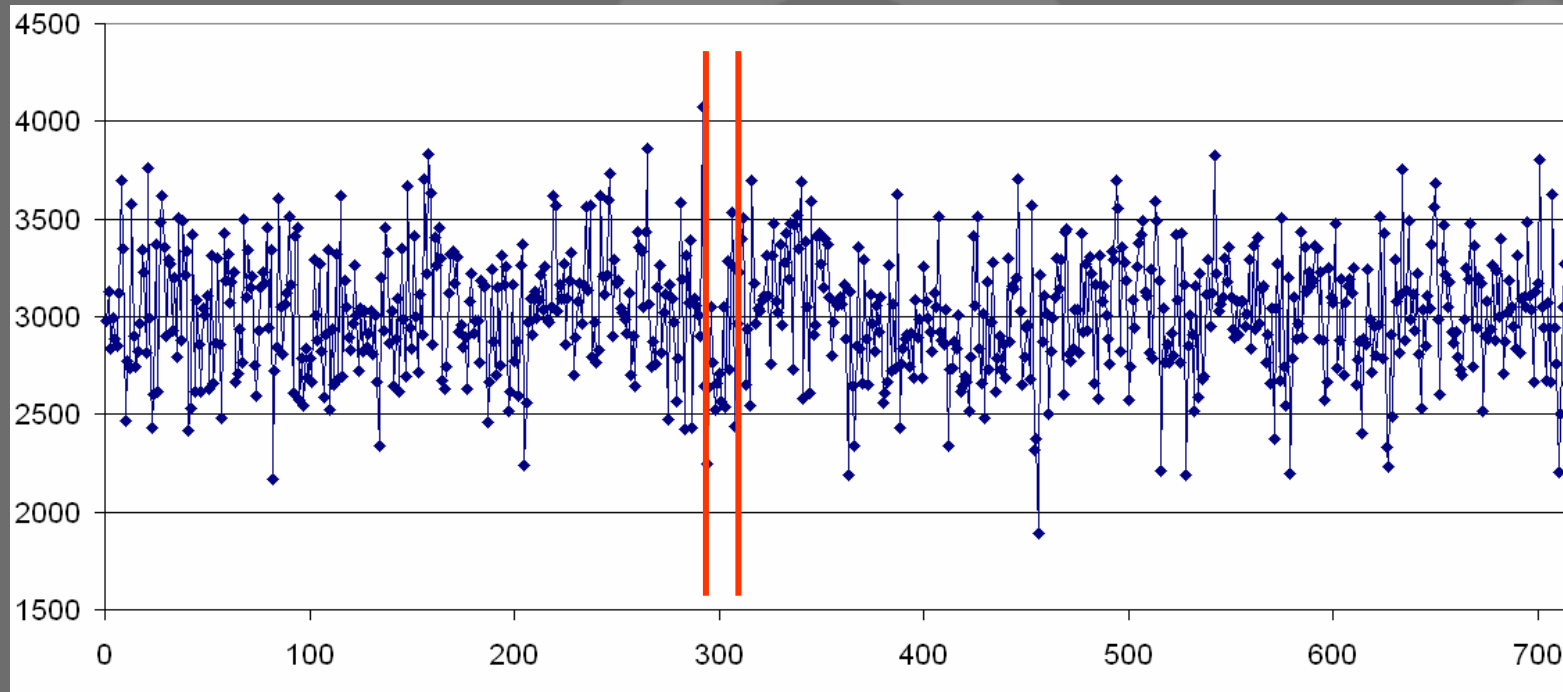


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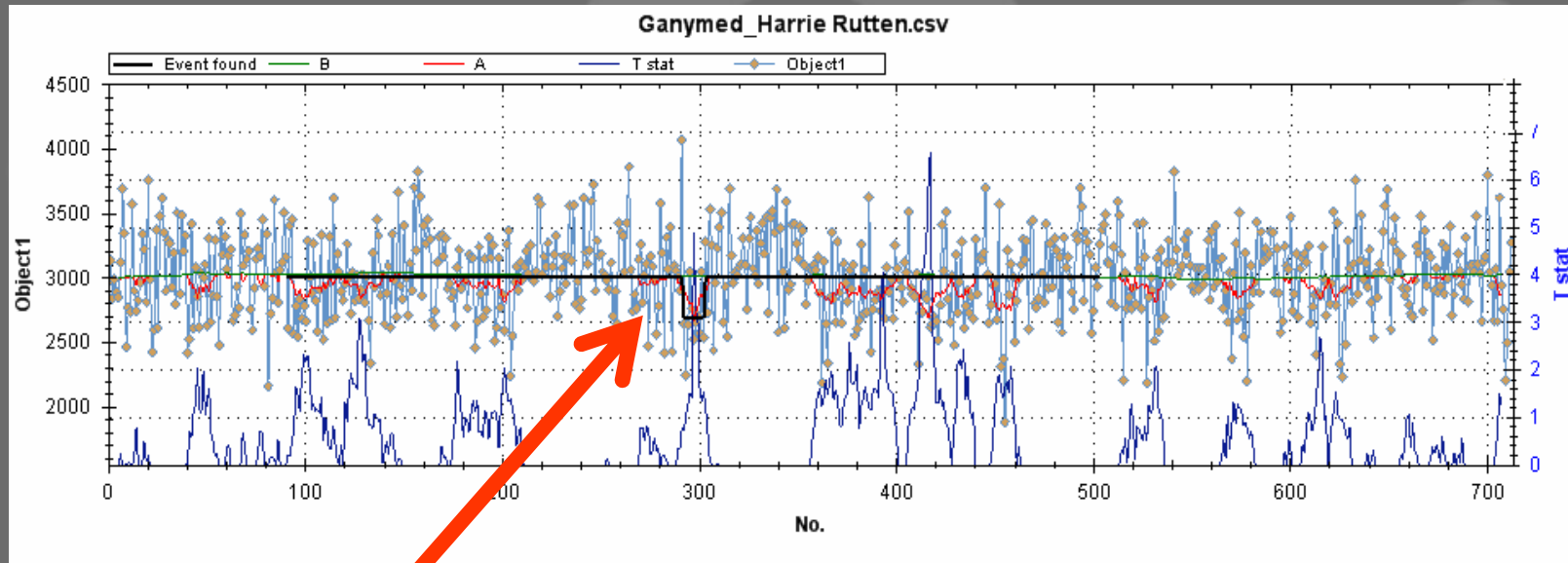


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Occular found the same 'event' as I did

but it was not significant!

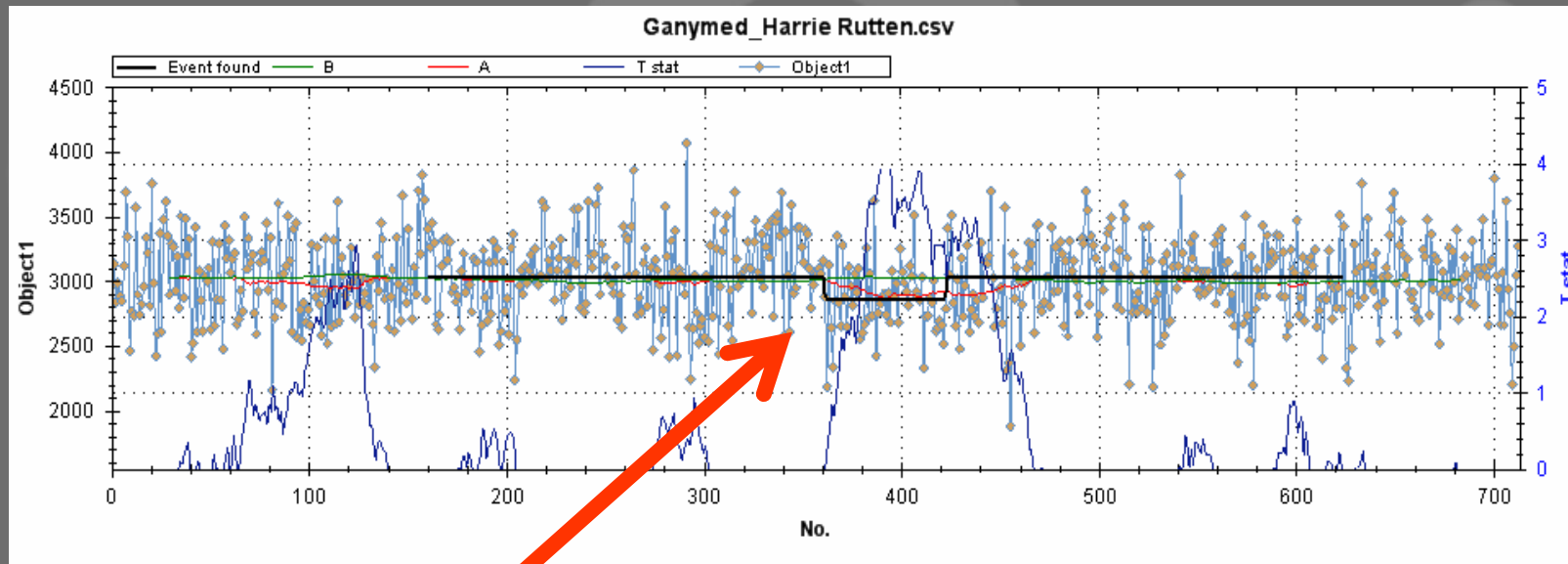


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Ocular found a second 'event'

but, is this the occultation?



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For 1.5 years the video sequence is still in the highest resolution in the Panasonic HQ HDD recorder in my observatory and had to find the sequence where a possible occultation could be

Without a prediction anymore?

HOW?



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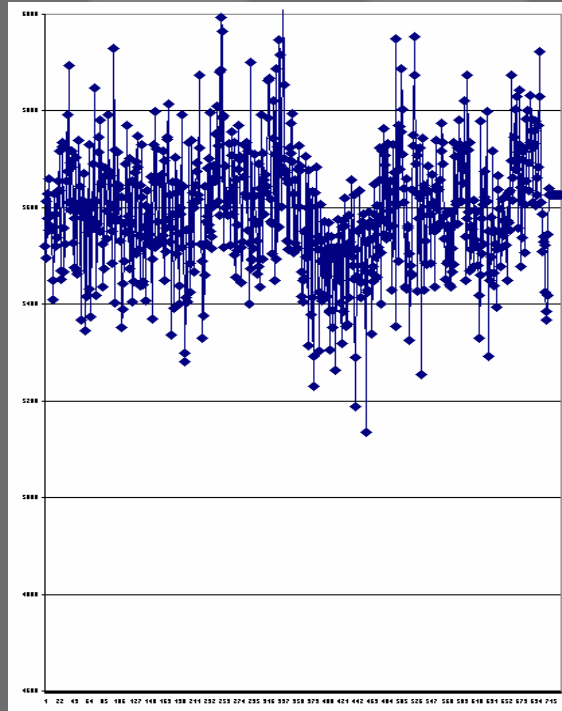
- In blocks of 20 seconds I digitized the whole 4m51s sequence
- every block I optimized the ROI of Limovie to get the best S/N ratio.
  - every sequence had an overlap with 10s (=50%) of the previous
  - compressed the graphical display and used my eyes as filter

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After many hours

# WOW: SUCCESS

## This is clear: an occultation!

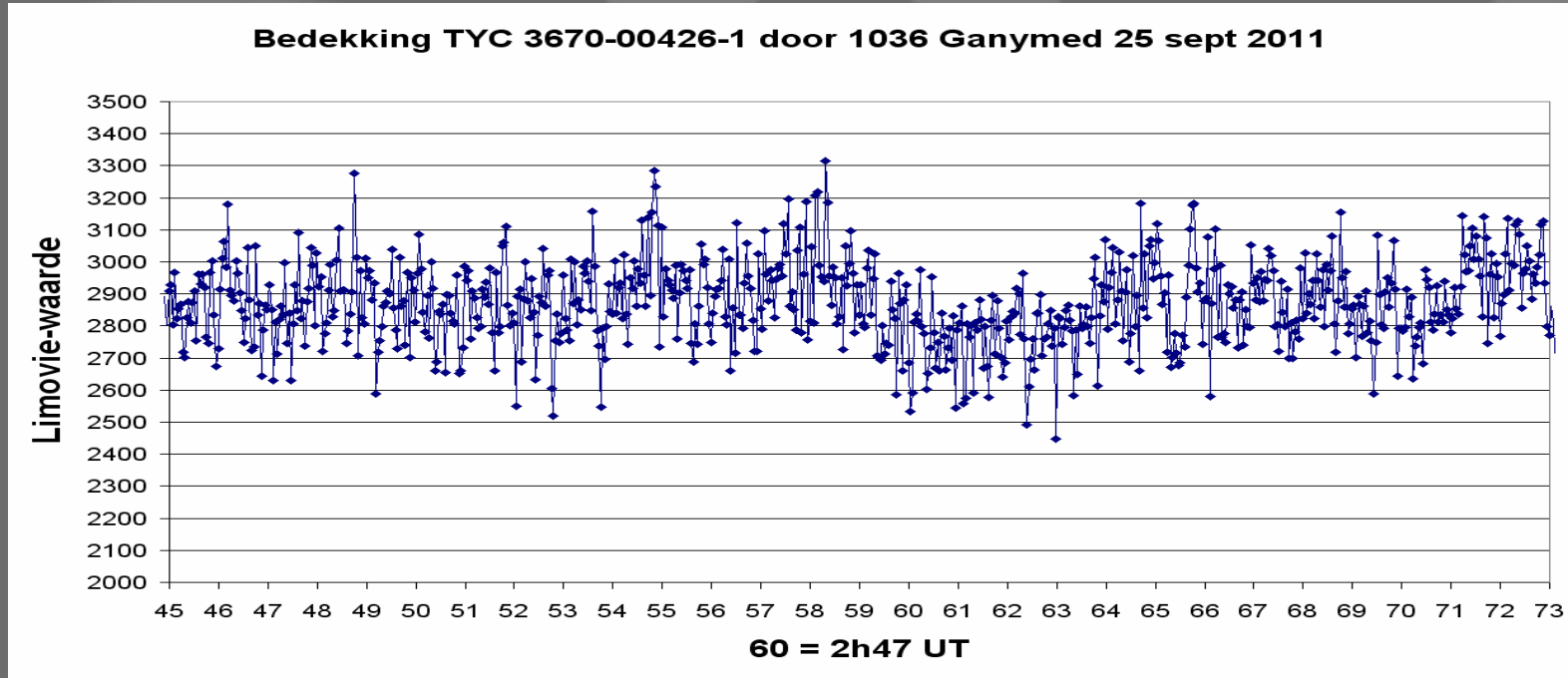


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**The exaggerated sequence**



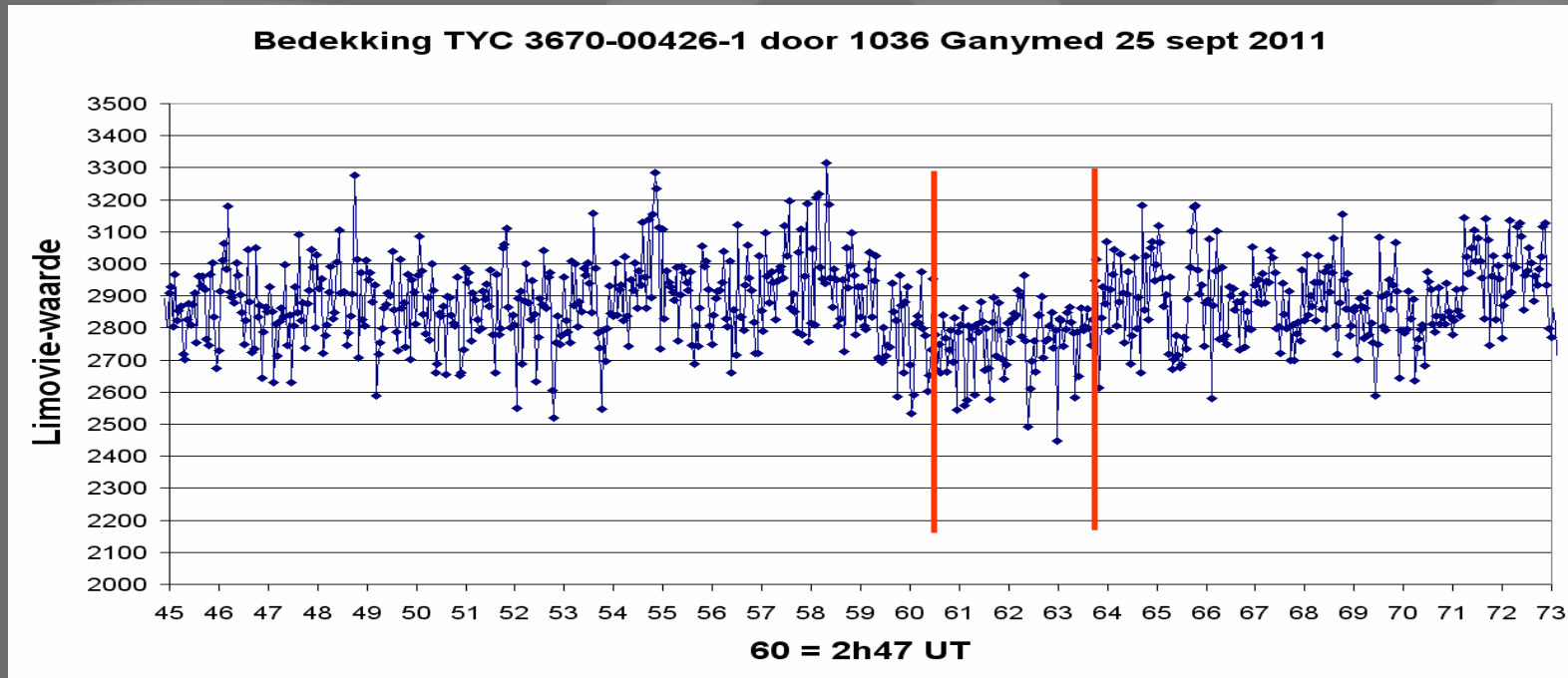


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**The Occultation:**

**D: 2h47m00.47s**

**R: 2h47m03.67s**

**Now to find an old prediction for confirmation**



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Where to find an old prediction of this event?

- EAON? No
- Euraster? No
- Gofin? No
- OW? No





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- ITOA\_ES? **YES** by Oliver Klös

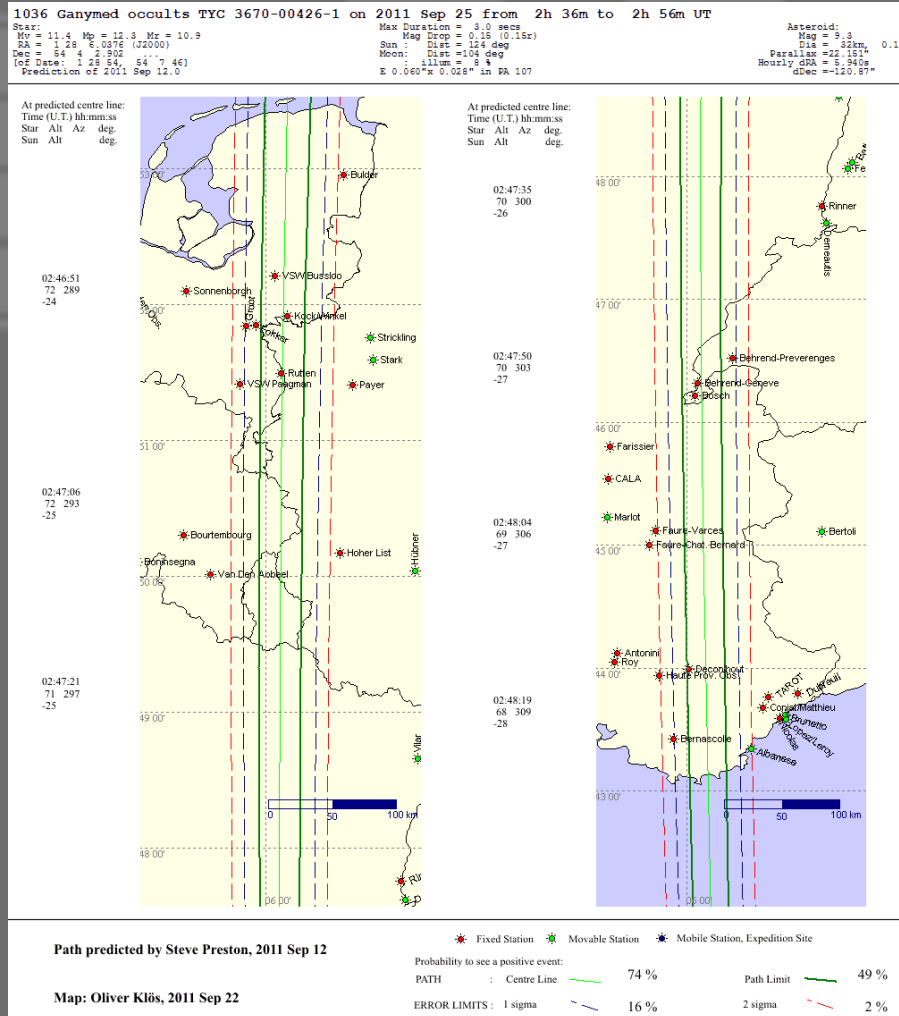


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Prediction at IOTA\_ES site  
 by Oliver Klös

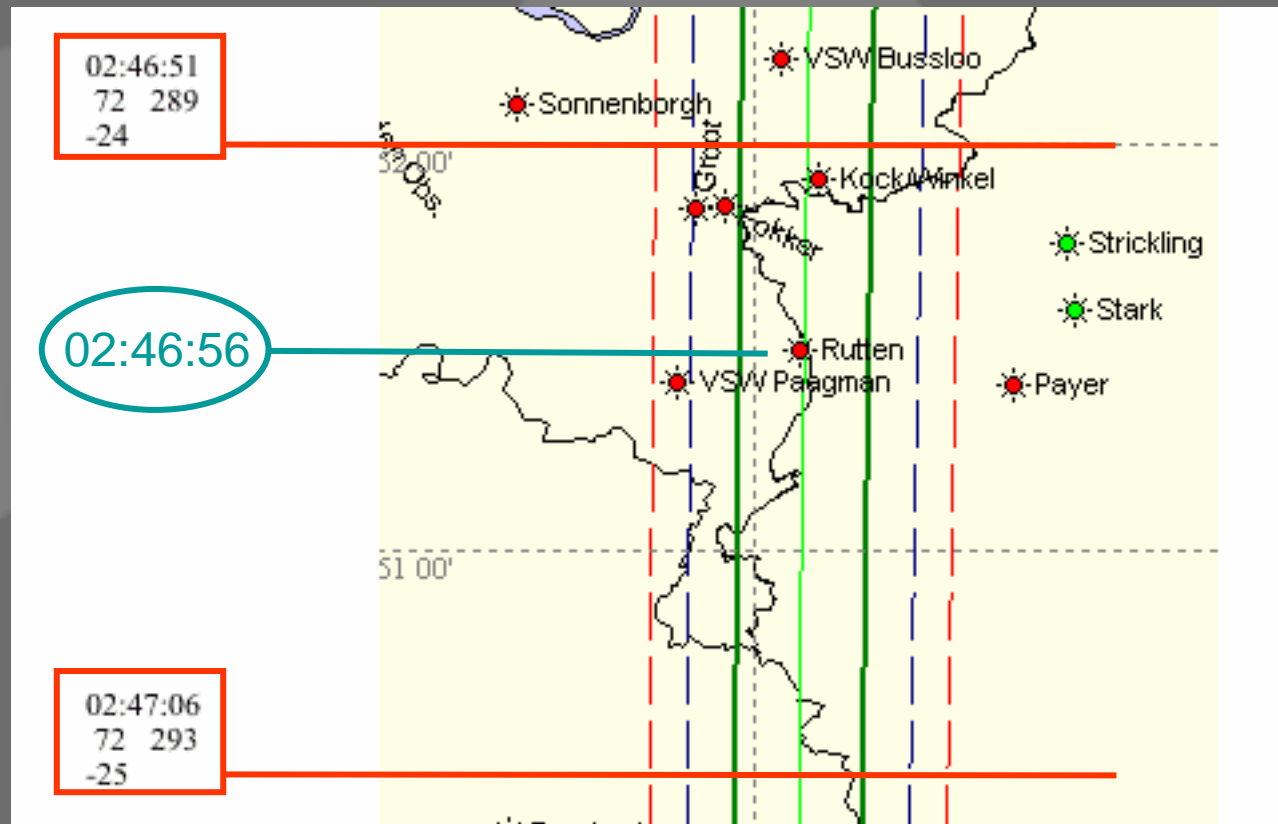


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1036 Ganymed occults TYC 3670-00426-1 on 2011 Sep 25 from 2h 36m to 2h 56m UT

Star:  
 Mv = 11.4 Mp = 12.3 Mr = 10.9  
 RA = 1 28 6.0376 (J2000)  
 Dec = 54 4 2.902 ...  
 [of Date: 1 28 54, 54 7 46]  
 Prediction of 2011 Sep 12.0

Max Duration = 3.0 secs  
 Mag Drop = 0.15 (0.15r)  
 Sun : Dist = 124 deg  
 Moon: Dist = 104 deg  
 : illum = 8 %  
 E 0.060"x 0.028" in PA 107

Asteroid:  
 Mag = 9.3  
 Dia = 32km, 0.111"  
 Parallax = 22.151"  
 Hourly dRA = 5.940s  
 dDec = -120.87"

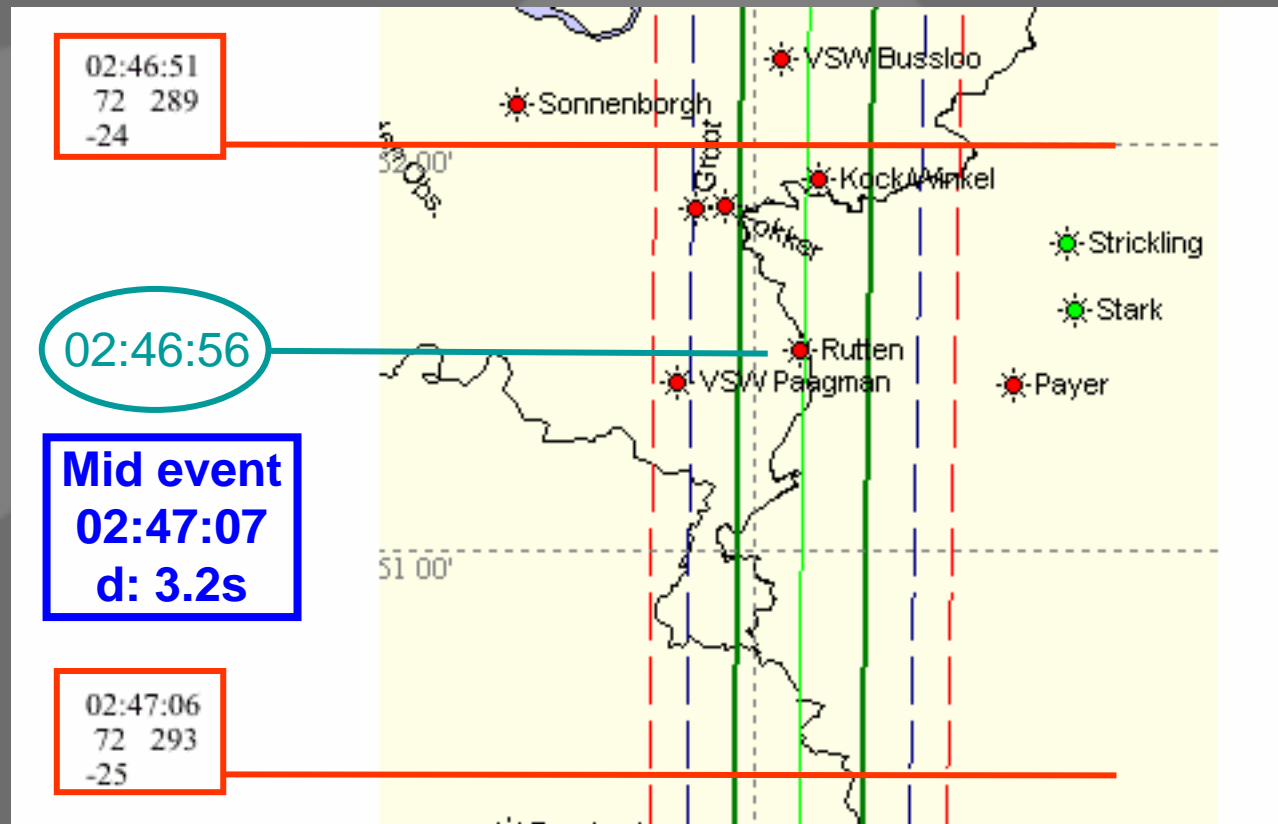


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## Concluding Remarks:

- Never throw an observation into the trash
- Take your time to analyse an observation
- Be familiar with the programs you use
- Report always a 'negative' observation
- Compare with other observations
- Sometimes you will have a surprise: “-” → “+”
- Be patient!



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