Call for campaign : Ganymede III 14/10/2025

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ESOP 2025 - Zoom

Sunday 24th of Aug 9:00

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Journal for Occultation Astronomy

CALL FOR OBSERVATIONS:

Ganymede Occulting a Magnitude 7 Star - A Call for a European Wide Campaign

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with

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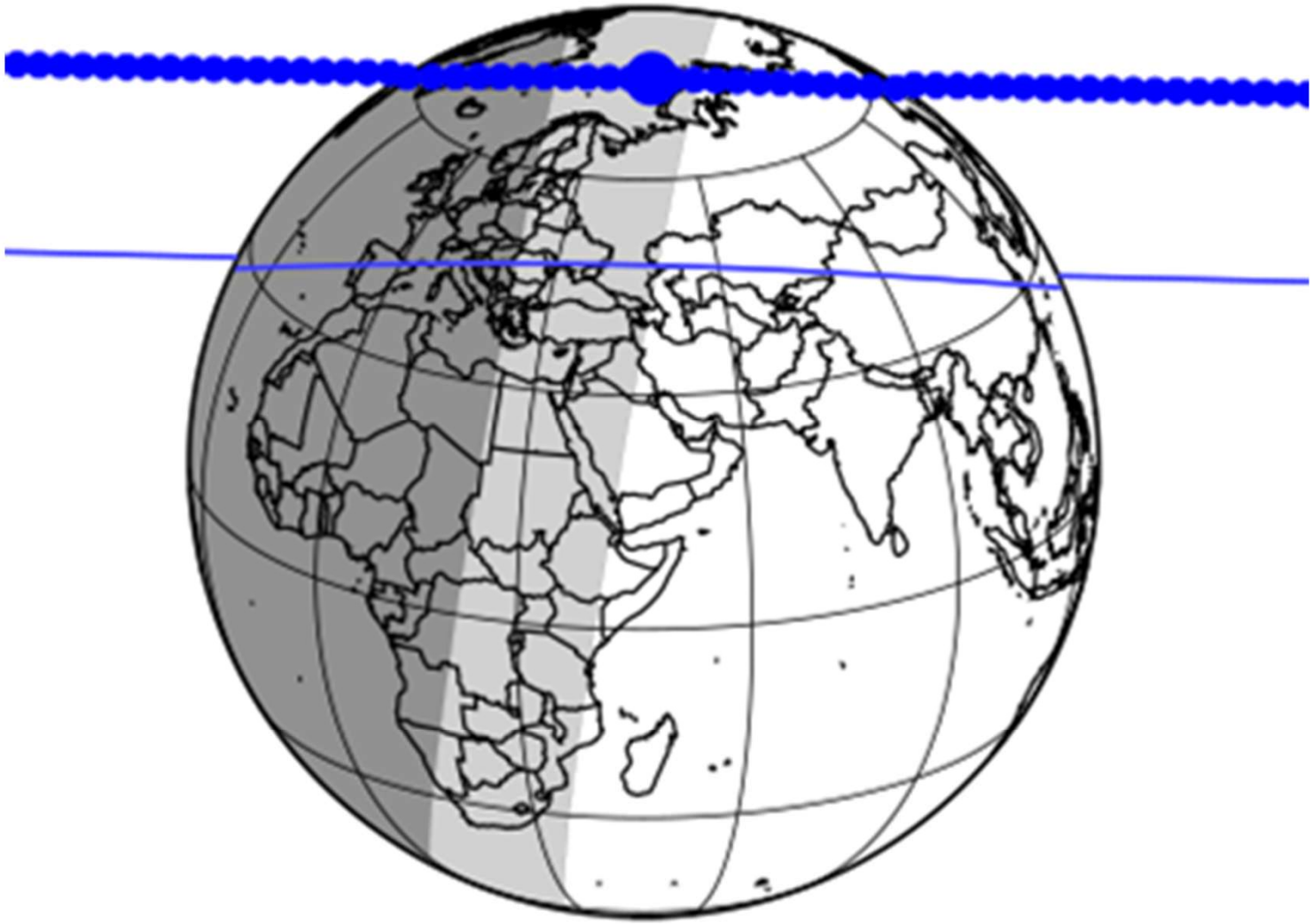
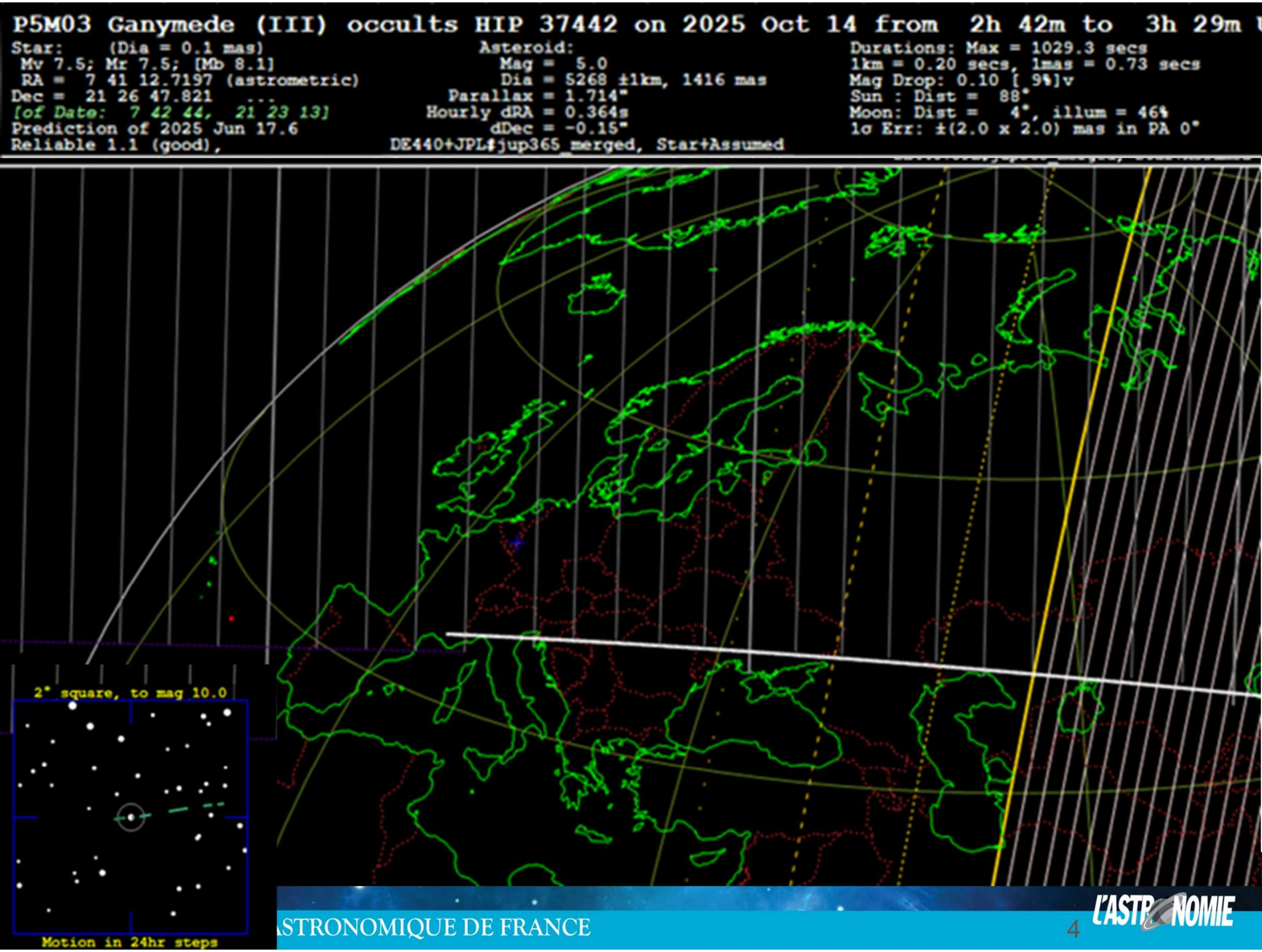
ABSTRACT: An exceptional event is scheduled on 2025 October 14. Jupiter's satellite Ganymede III will occult a magnitude 7.5 star for observers in western Europe, causing a small drop in brightness of 0.1 magnitudes for up to 17 minutes. This occultation is motivating a campaign to achieve three ambitions. This paper shares all the data to allow you to join this "2025 Ganymede Campaign". Amateur and professional collaborations on stellar occultations by solar system bodies is a very active field in astronomy. Some of these events are important to motivate a wide mobilisation of the amateur community. Here, Ganymede, the star itself and the network of amateurs are the three targets of this campaign. This event seems obvious and a nice opportunity for a beginner to join the community, in fact this event is elusive to catch with naked eye in using a telescope. It requires a video recording to get the event from the processing and to deliver useful data.

Ganymede, GaiaDR3+pmGaiaDR3, INPOP19a-NOE5-202&app.dis.to planet: 9.3R_p
updated: 2024-08-30 by Lucky Star

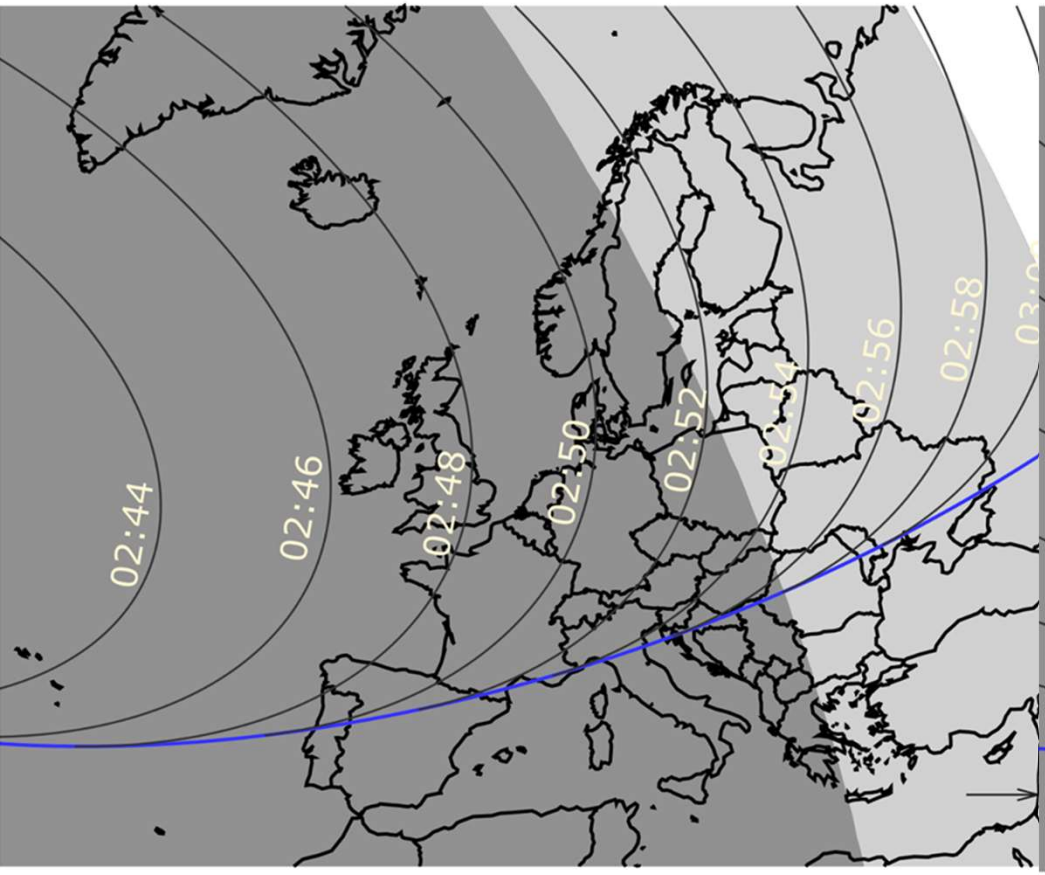


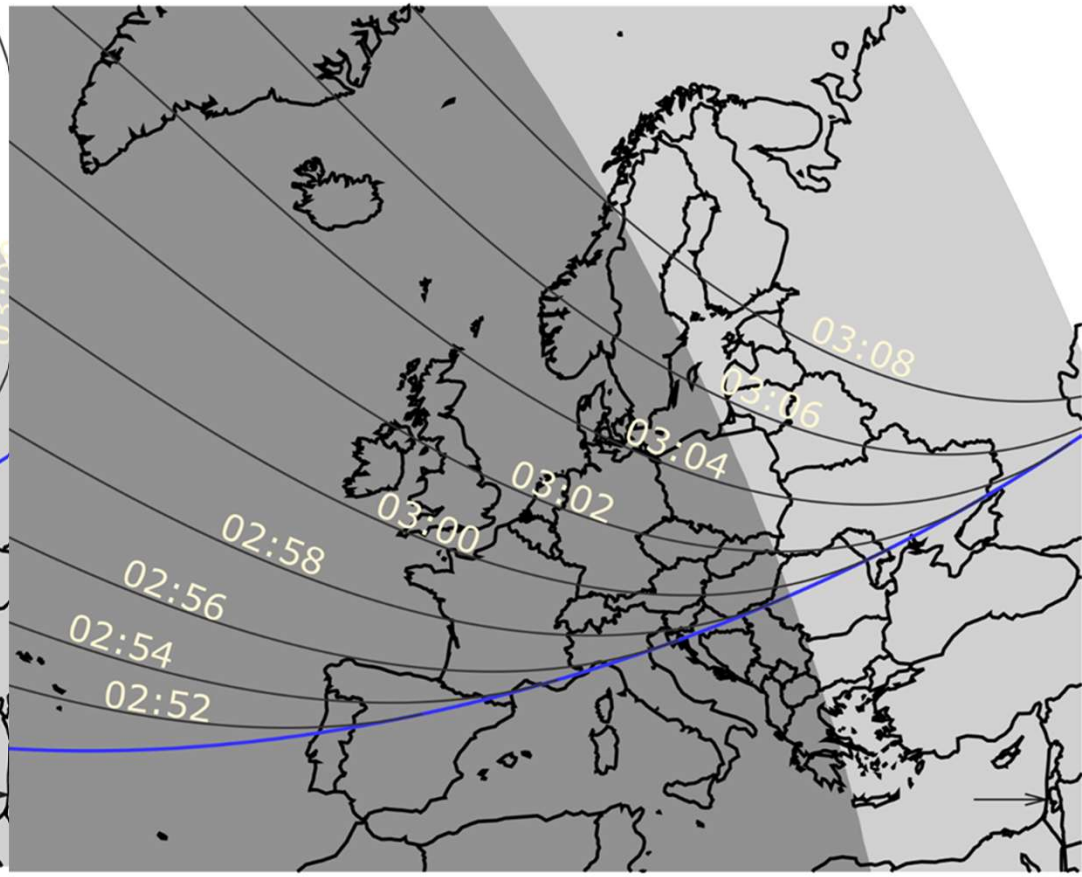
yyyy mm dd hh:mm:ss.s	RA_star_J2000	DE_star_J2000	C/A	P/A	vel	Delta	G	RP	H
2025-10-14 03:04:44.7	07 41 12.7200	+21 26 47.821	1.447	1.43	5.12	5.1298	7.5	6.8	5.3

LuckyStar prediction


P5M03 Ganymede (III) occults HIP 37442 on 2025 Oct 14 from 2h 42m to 3h 29m U
Star: (Dia = 0.1 mas)
Mv 7.5; Mr 7.5; [Mb 8.1]
RA = 7 41 12.7197 (astrometric)
Dec = 21 26 47.821 ...
[of Date: 7 42 44, 21 23 13]
Prediction of 2025 Jun 17.6
Reliable 1.1 (good),
Asteroid:
Mag = 5.0
Dia = 5268 ±1km, 1416 mas
Parallax = 1.714"
Hourly dRA = 0.364s
dDec = -0.15"
DE440+JPL#jup365_merged, Star+Assumed
Durations: Max = 1029.3 secs
1km = 0.20 secs, 1mas = 0.73 secs
Mag Drop: 0.10 [9%]v
Sun : Dist = 88°
Moon: Dist = 4°, illum = 46%
1σ Err: ±(2.0 x 2.0) mas in PA 0°
2° square, to mag 10.0
Motion in 24hr steps

Immersion and emersion isotime curves





LTE Observatoire de Paris


Pollux
Wasat
κ Gem
Lune
Jupiter

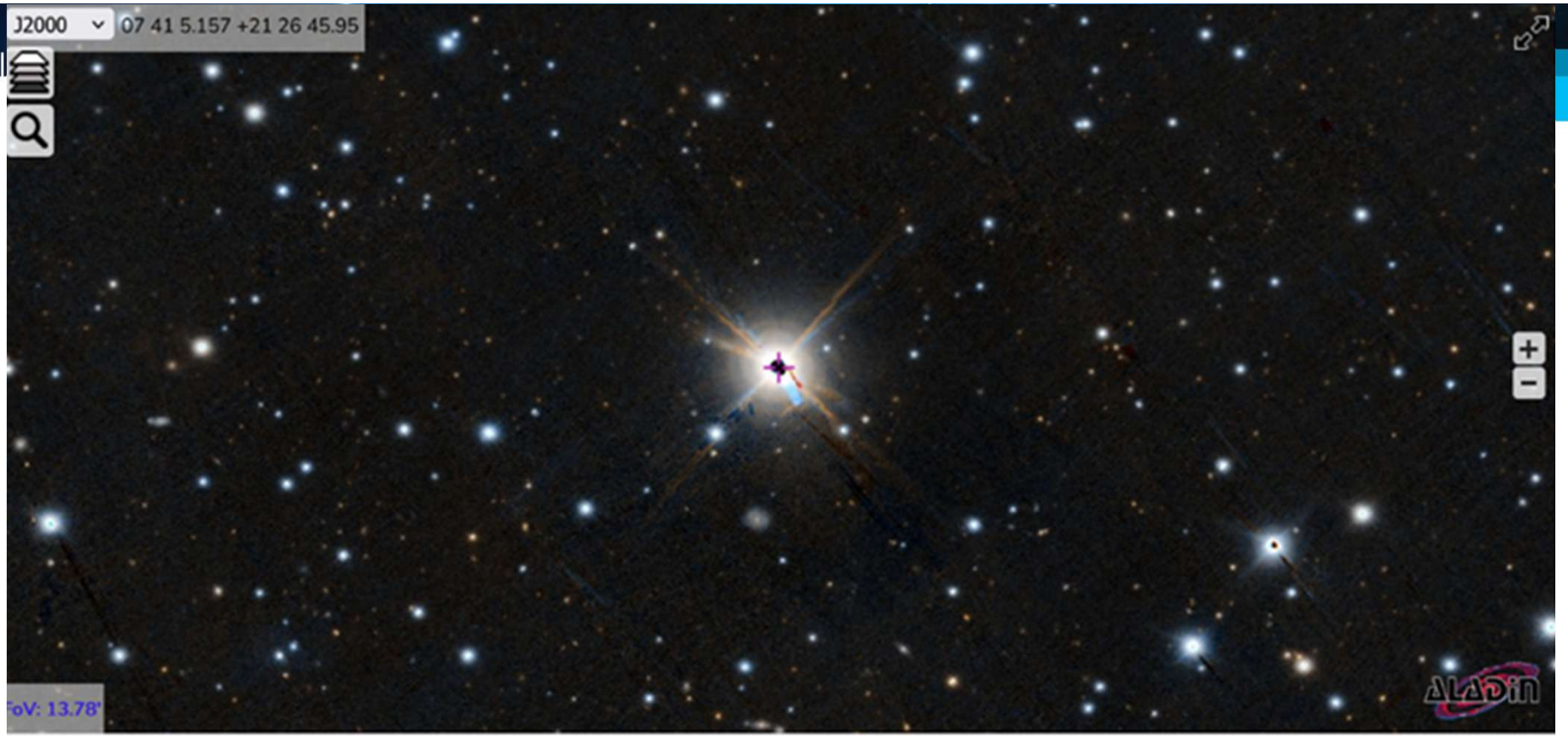
Magnitude data

The V magnitudes of the Jupiter satellites are

	HorizonJPL	Stellarium	
• Io I			is hide behind the planet during the event
• Europe II	5.8	5.9	the preferred reference satellite to reduce the light curve
• Ganymede III	5.25	5.31	the occulting body (the magnitude during the event)
• Callisto IV	6.5	6.61	useful to record if you have a large field of view

The occulted star magnitude is

• Occulted star	7.5	G mag	
•	6.8	Grp	
•	8.1	Gbp	
• Ganymede+star	5.12	G	or 5.02 Grp (the magnitude before and after the event)

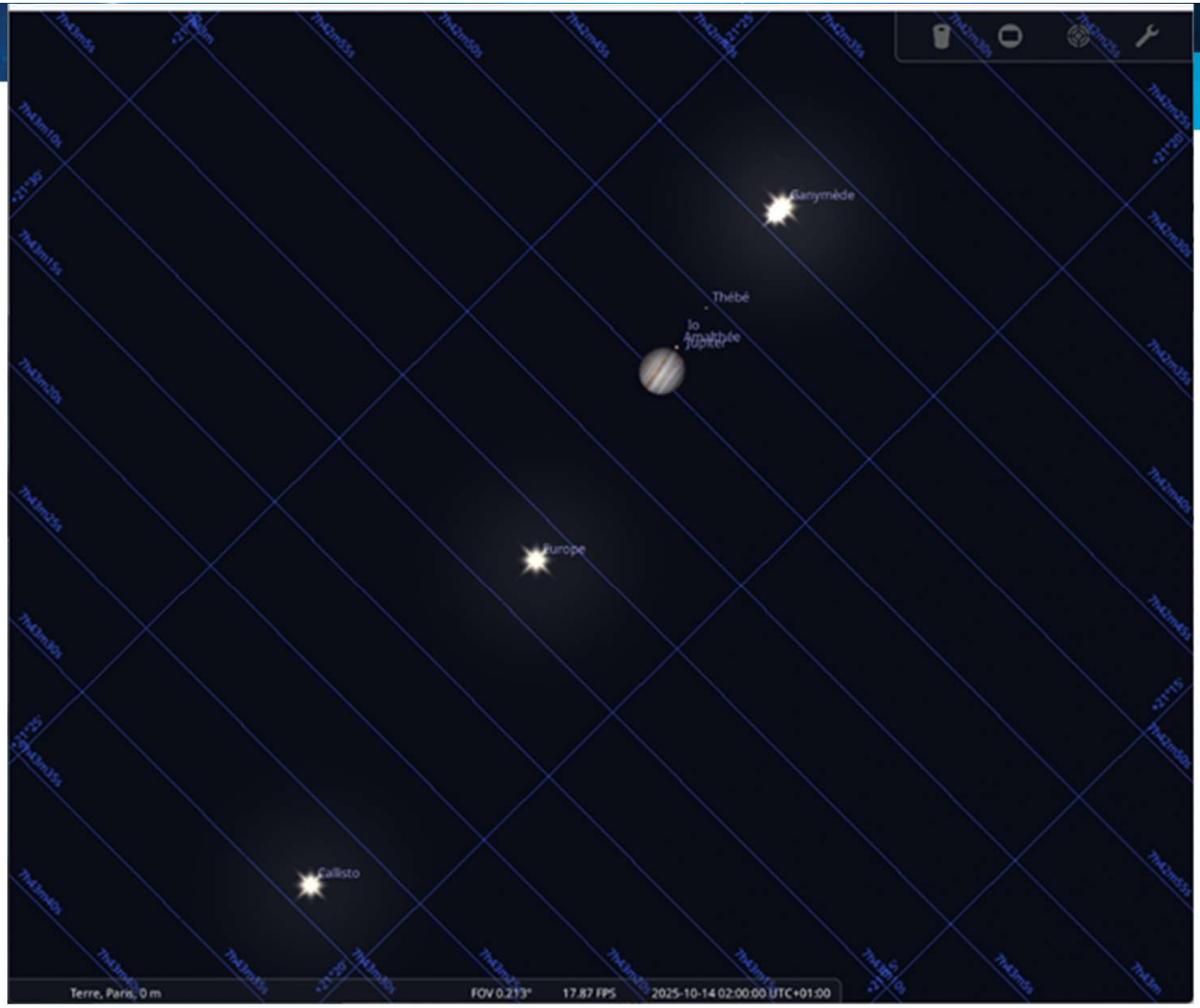


- What about the star HD 61660 ? (from Vizier CDS)
  - K2 spectral type, Bmag 9.04, Vmag 7.87, Rmag 6.99, Imag 6.39
  - Gaia mag : G 7.5, Gbp 8.1, Grp 6.8
  - Diameters B 0.437288mas, V 0.446247mas, R 0.452191mas, I 0.458328mas

The JMMC Stellar Diameters Catalog v2 (JSDC): A New Release Based on SearchCal Improvements
Bourgés, L. ; Lafrasse, S. ; Mella, G. ; Chesneau, O. ; Bouquin, J. L. ; Duvert, G. ; Chelli, A. ; Delfosse, X.

Sampling the star diameter :

- Assuming a 0.45mas diameter star
- The Ganymede velocity is 5.12km/s which gives 1.4mas/s angular speed
  A 100fps frame rate stands for a 0.014mas step (higher rates are welcomed)
- Therefore we may foresee here 32 frames to cover the star.
- In addition performing this measurement from various latitudes will give us the ability to check any ellipsoidal star cross section.
- We will have here a nice opportunity to check the occultation technique star diameter angular accuracy to be compared with optical interferometry.



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Ganymede (III)

Europa (II)

Callisto (IV)

Probe the Ganymede atmosphere if any ?

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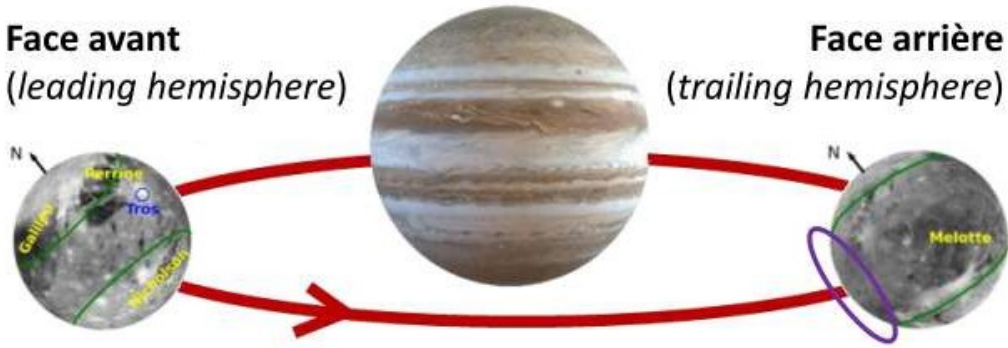
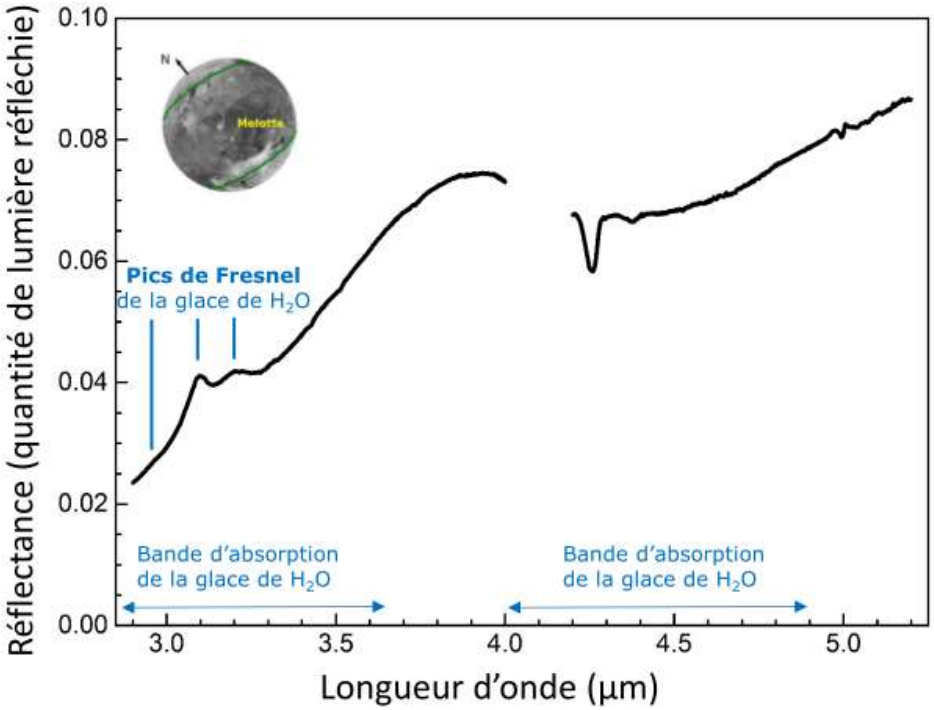
Detection of morning frost on the Ganymede's surface.

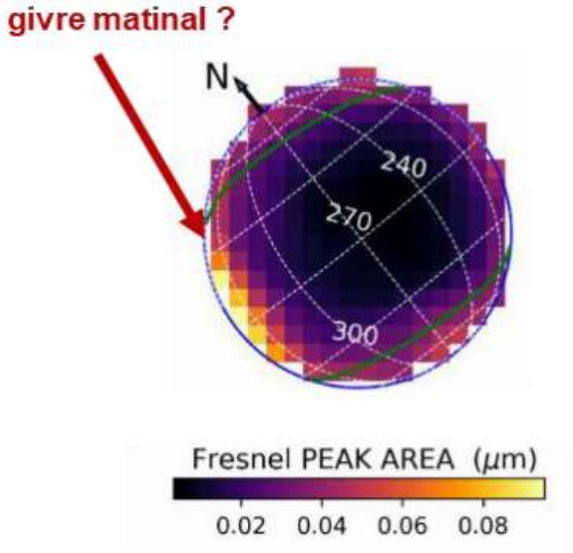
Ganymède est en rotation synchrone autour de Jupiter



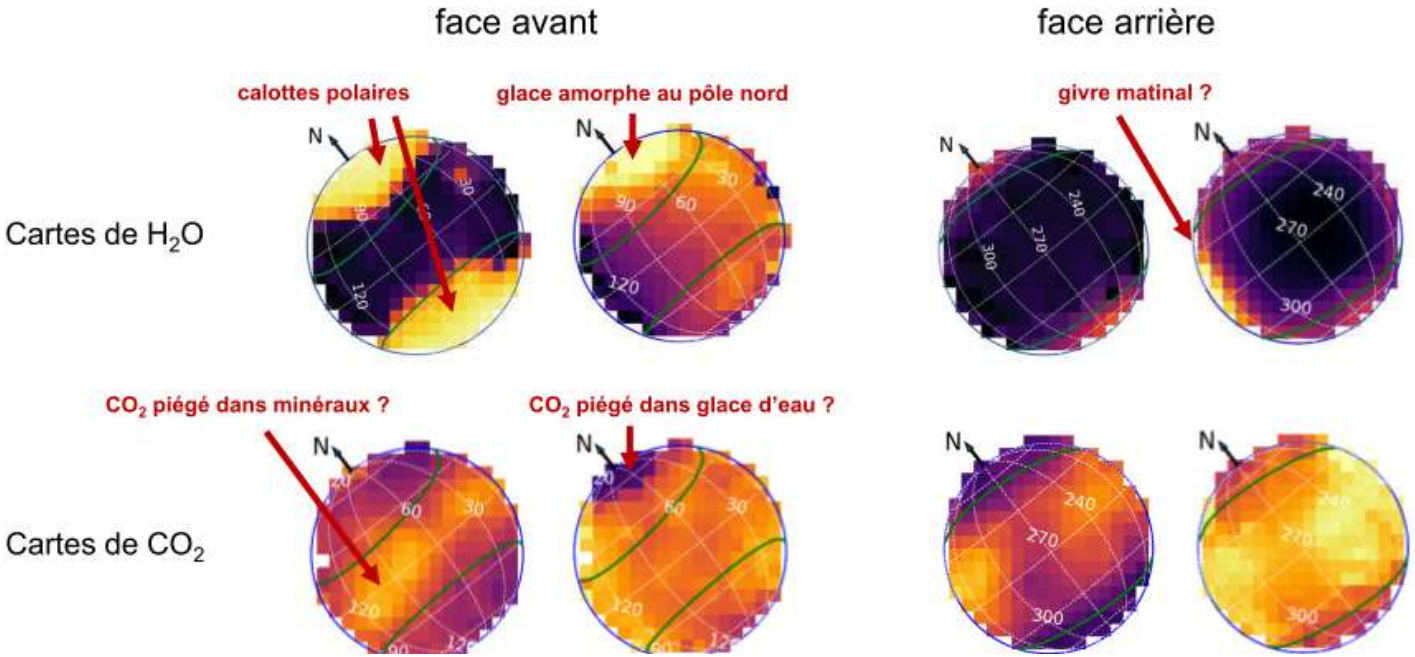
Spectre de la lumière réfléchie par l'ensemble de la face arrière, obtenu par l'instrument NIRSpec sur le télescope James Webb



Carte de l'intensité du pic de Fresnel à 3.1 µm sur la face arrière



Pour info : d'autres cartes des paramètres spectraux de H2O et CO2, obtenues grâce au JWST/NIRSpec



Observers : _____ Page ___ of _____

Telescope : _____ Camera : _____ Laptop : _____ Track : _____

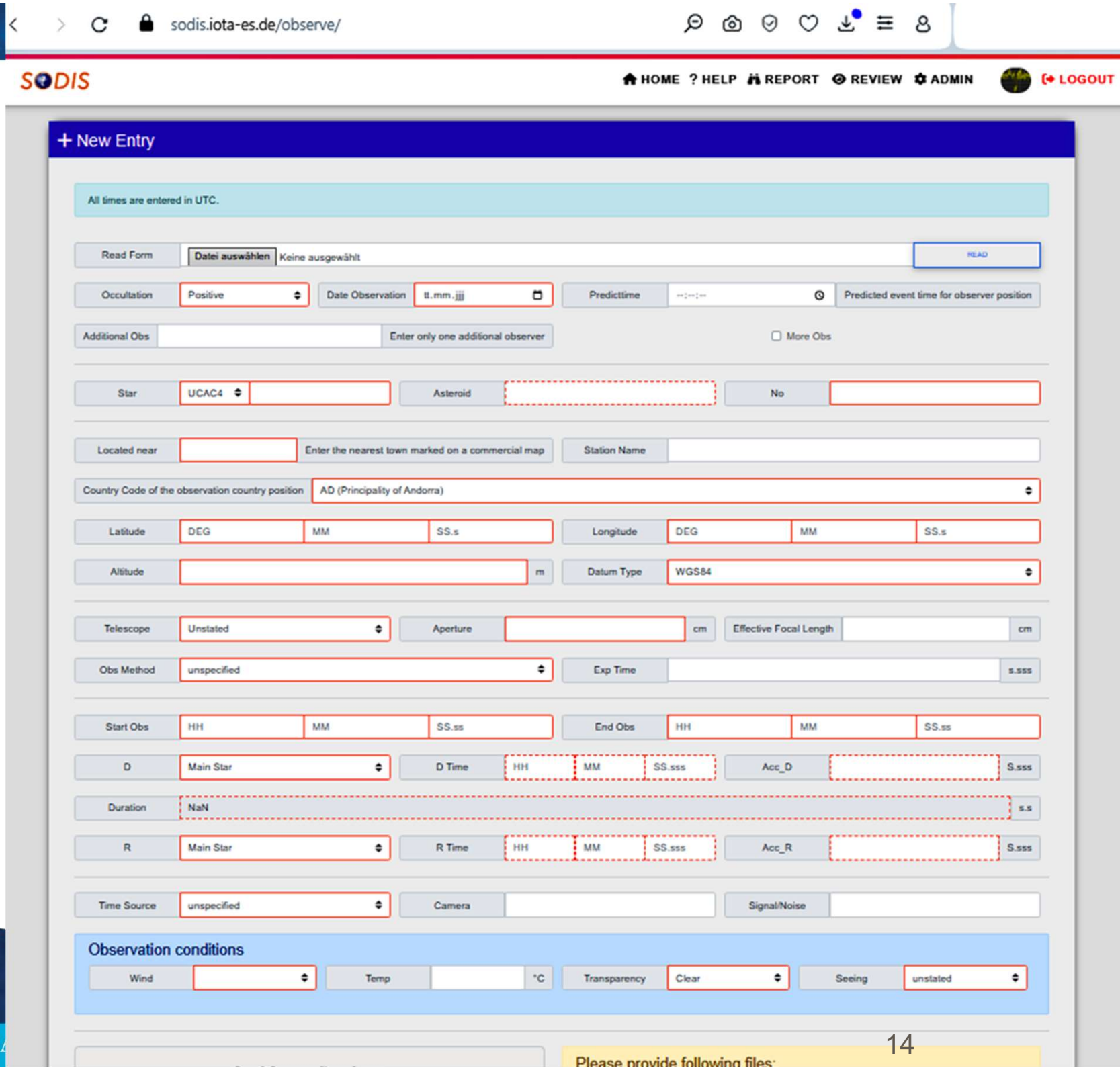
UT date : _____ Site Latitude: _____ Longitude : _____ Altitude : _____

Time setup : _____ Temperature _____ Wind speed / direction _____
Time packed: _____ RH % dew _____ CCD temp _____
Clouds : _____ Barometer _____ Seeing _____

UT folder name	Object Name	Nexp/Duration	Exposure	Gain	Offset	Comments

you can report your observations using this link:
https://occultation.trgozlemevleri.gov.tr/create_report/2373/

Sodis report



Europa, GaiaDR3+pmGaiaDR3, INPOP19a-NOE5-2023 Offset: 0.0mas 0.0mas

updated: 2025-06-11 by Lucky Star

yyyy mm dd hh:mm:ss.s	RA_star_J2000	DE_star_J2000	C/A	P/A	vel	Delta	G*	RP*	H*
2025-10-13 10:23:48.5	07 41 12.7200	+21 26 47.821	0.407	190.29	27.38	5.1505	7.9	7.1	5.7

Briefing meeting and last updates

- Prepare the latency database attached to each occultation observers
- Test and tune your setup to deliver useful data
  - For the checking of Ganymede ephemeris and update it for space missions on the way
  - To measure the diameter and cross section shape of the star
  - To attempt the detection of Ganymede atmosphere

- Saturday 4th of october 14h30 (Paris or CET) or 12h30 UTC
- From SAF JC Pecker room and Zoom :

https://us02web.zoom.us/meeting/register/jAscIm4iQUKxvu8q2tmOxA

With : Valery Lainey
Josselin Desmars
Arnaud Leroy
Thierry Midavaine

Remind your members in 2026 a new Phemu season is going to open !

References (bibliography and web links) :

[1] W. Beisker, K. Guhl, T. Midavaine: contributions of “citizen science” to occultation astronomy. Philosophical Transactions of the Royal Society A : Major advances in planetary sciences thanks to stellar occultations Feb 2025

[2] D. Herald : presentations to IOTA and TTOA annual meetings and private communications from statistics listing in Occult

[3] C. Weber : personal communication on SODIS, https://sodis.iota-es.de

[4] Roadies : https://gemini.obspm.fr/20240701-roadies/

[5] Lucky-Star Ganymede event : https://lesia.obspm.fr/lucky-star/occ.php?p=146057

[6] Ganymede event web page on the Gemini portal : https://gemini.obspm.fr/20250609-occultation-ganymede/

[7] Occultation Portal : https://occultation.trgozlemevleri.gov.tr/

[8] SODIS : https://sodis.iota-es.de/ and https://www.iota-es.de/sodis/IOTA-ES_report.txt

[9] Lucky-Star Europa event : https://lesia.obspm.fr/lucky-star/occ.php?p=147471

[10] M. Delcroix, O. Poch : Détection de givre matinal à la surface de Ganymède, Journée de la SF2A July 2025 Toulouse. https://gemini.obspm.fr/20241020-givre-ganymede/

International Network of Astronomy Amateur Organizations

Next IAU General Assembly

- 10 - 19 August 2027 in Roma

- PARC initiative
- (Pro Am Research Collaboration)

- Amateur Engagement Subworking Group