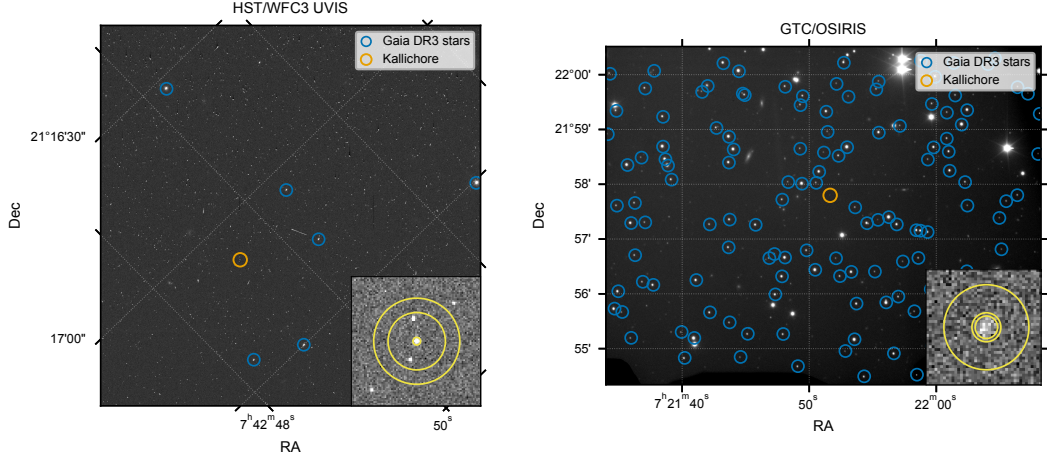

Kilometre-scale Jovian moon characterized for a potential JUICE flyby

In the format provided by the
authors and unedited

Supplementary Information

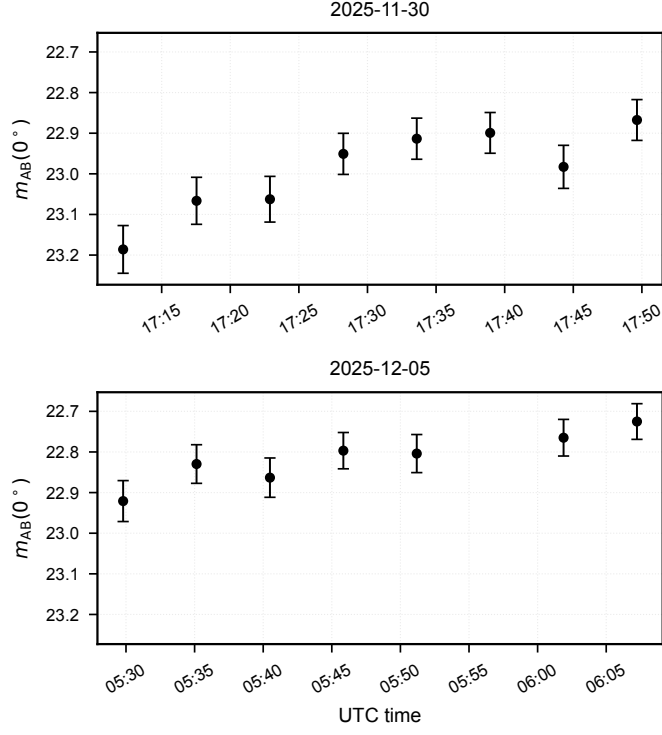


Supplementary Figure 1: Left: *HST*/WFC3–UVIS F606W image (ID *ifry02l1q_flg*) obtained on 5 December 2025 with an exposure time of 97 s. Right: *GTC*/OSIRIS Sloan *r*-band image (ID 0005821249) obtained on 21 January 2026 with an exposure time of 50 s. Blue circles indicate Gaia DR3 reference stars used for the astrometric solution, while the orange circle marks Kallichore. In each panel, the lower-right inset shows a zoomed view of Kallichore with the photometric apertures and sky annuli overlaid. Dotted lines represent the J2000 equatorial coordinate grid.

Supplementary Table 1: Astrometric positions of Kallichore measured with *HST*/WFC3.

WFC3 dataset	UTC mid-time	α (h m s)	δ ($^{\circ}$ ' ")	$\Delta(\alpha \cos \delta)$ (mas)	$\Delta\delta$ (mas)
ifry01e5q	2025-11-30 17:12:11.5	07 43 49.722290	+21 15 22.88153	26.53	-19.32
ifry01e6q	2025-11-30 17:17:32.5	07 43 49.654736	+21 15 23.00223	26.26	-15.42
ifry01e7q	2025-11-30 17:22:53.5	07 43 49.572653	+21 15 23.18058	34.46	-19.00
ifry01e8q	2025-11-30 17:28:14.5	07 43 49.479657	+21 15 23.41812	31.60	-14.36
ifry01e9q	2025-11-30 17:33:35.5	07 43 49.383380	+21 15 23.68051	36.38	-15.29
ifry01eaq	2025-11-30 17:38:56.5	07 43 49.289506	+21 15 23.94798	33.56	-17.12
ifry01ebq	2025-11-30 17:44:17.5	07 43 49.205336	+21 15 24.19237	35.71	-22.75
ifry01ecq	2025-11-30 17:49:38.5	07 43 49.135347	+21 15 24.40983	32.53	-13.23
ifry02kuq	2025-12-05 05:29:47.5	07 42 49.817452	+21 17 06.58096	27.52	-13.89
ifry02kvq	2025-12-05 05:35:08.5	07 42 49.740662	+21 17 06.89942	31.43	-22.77
ifry02kwq	2025-12-05 05:40:29.5	07 42 49.648790	+21 17 07.30820	31.26	-16.66
ifry02kxq	2025-12-05 05:45:50.5	07 42 49.546378	+21 17 07.74205	26.60	-22.68
ifry02kyq	2025-12-05 05:51:11.5	07 42 49.440400	+21 17 08.18340	33.01	-15.56
ifry02l0q	2025-12-05 06:01:53.5	07 42 49.239717	+21 17 08.87009	31.39	-17.70
ifry02l1q	2025-12-05 06:07:14.5	07 42 49.156566	+21 17 09.06355	27.57	-17.25

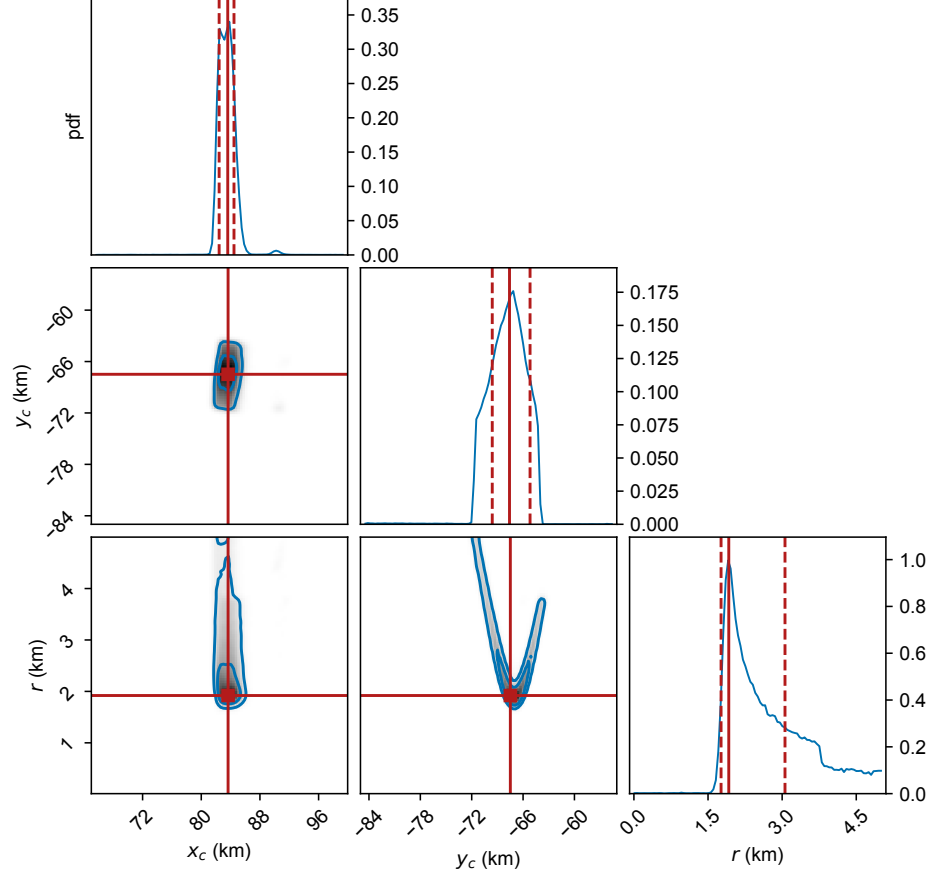
Right ascension (α) and declination (δ) are the measured equatorial coordinates in the J2000 reference frame. $\Delta(\alpha \cos \delta)$ and $\Delta\delta$ denote the astrometric O-C residuals relative to the JPL ephemeris solution for Kallichore (544) (`jup347_merged.DE442`), computed in an HST-centric reference frame.



Supplementary Figure 2: Phase-corrected AB magnitude as a function of time for the *HST* observations. The top panel corresponds to 30 November 2025, and the bottom panel to 5 December 2025. Error bars represent the photometric uncertainties derived from the signal-to-noise ratio (SNR) photometry, and symbols correspond to the measured phase-corrected AB magnitudes for each individual exposure.

Supplementary Table 2: Properties of the occulted star. Coordinates are given at epoch J2016 in the ICRF, and the apparent stellar diameter is taken from [1] in the B band.

<i>Gaia</i> DR3 ID	α (h m s)	δ ($^{\circ}$ ' ")	G, B (mag)	Apparent diameter (mas)
673238292608047232	07 39 46.77065	+21 22 56.92511	13.495, 15.590	0.0125



Supplementary Figure 3: Posterior probability distributions for the occultation model parameters. Diagonal panels show the one-dimensional marginalized posterior probability density functions for each parameter. Off-diagonal panels display the two-dimensional joint posterior distributions for all parameter pairs. The contour levels enclose the 39.3% and 86.4% credible regions, corresponding to 1σ and 2σ for a two-dimensional Gaussian distribution, respectively.

Supplementary Table 3: Astrometric positions of Kallichore measured with *GTC*.

OSIRIS dataset	UTC mid-time	α (h m s)	δ ($^{\circ}$ ' ")	$\Delta(\alpha \cos \delta)$ (mas)	$\Delta\delta$ (mas)
0005821249	2026-01-21 23:11:31.511	07 21 51.570480	+21 57 49.96080	64.86	-46.60
0005821250	2026-01-21 23:12:57.011	07 21 51.544080	+21 57 49.94280	112.18	-119.47
0005821251	2026-01-21 23:14:15.010	07 21 51.505920	+21 57 50.19120	-40.45	78.90
0005821252	2026-01-21 23:15:33.010	07 21 51.476400	+21 57 50.13360	-72.87	-28.71
0005821254	2026-01-21 23:18:09.011	07 21 51.423120	+21 57 50.46840	-57.52	206.14
0005821255	2026-01-21 23:19:27.010	07 21 51.401760	+21 57 50.34600	23.62	33.80
0005821256	2026-01-21 23:20:45.011	07 21 51.371280	+21 57 50.36760	-22.09	5.48
0005821257	2026-01-21 23:22:03.010	07 21 51.343920	+21 57 50.28480	-24.38	-127.22
0005821258	2026-01-21 23:23:21.011	07 21 51.320880	+21 57 50.29920	33.44	-162.70
0005821259	2026-01-21 23:24:39.009	07 21 51.293040	+21 57 50.73840	24.49	226.65
0005821260	2026-01-21 23:25:57.011	07 21 51.248880	+21 57 50.46480	-211.46	-96.78
0005821261	2026-01-21 23:27:15.011	07 21 51.240240	+21 57 50.70240	46.72	91.01
0005821262	2026-01-21 23:28:33.011	07 21 51.208800	+21 57 50.61960	-12.26	-41.58
0005821263	2026-01-21 23:29:51.011	07 21 51.180480	+21 57 50.78160	-27.82	70.66
0005821264	2026-01-21 23:31:09.011	07 21 51.156960	+21 57 50.63040	23.39	-130.29
0005821265	2026-01-21 23:32:27.011	07 21 51.125760	+21 57 50.72040	-32.21	-90.00
0005821266	2026-01-21 23:33:45.011	07 21 51.103200	+21 57 50.90400	32.39	43.90
0005821267	2026-01-21 23:35:03.011	07 21 51.075120	+21 57 50.81760	20.21	-92.17
0005821268	2026-01-21 23:36:21.011	07 21 51.043920	+21 57 50.97960	-35.36	20.17
0005821269	2026-01-21 23:37:39.011	07 21 51.021360	+21 57 50.90400	29.27	-105.06
0005821270	2026-01-21 23:38:57.011	07 21 50.993520	+21 57 51.04440	20.46	-14.26
0005821271	2026-01-21 23:40:15.011	07 21 50.958240	+21 57 51.15600	-91.83	47.75
0005821272	2026-01-21 23:41:33.011	07 21 50.935440	+21 57 51.13800	-30.51	-19.81
0005821273	2026-01-21 23:42:51.011	07 21 50.911200	+21 57 51.24960	10.79	42.26
0005821274	2026-01-21 23:44:09.011	07 21 50.887680	+21 57 51.20640	62.12	-50.46
0005821275	2026-01-21 23:45:27.011	07 21 50.853600	+21 57 51.35040	-33.45	44.05
0005821276	2026-01-21 23:46:45.011	07 21 50.829120	+21 57 51.39720	4.54	41.38
0005821277	2026-01-21 23:48:03.011	07 21 50.805600	+21 57 51.35400	55.89	-51.27
0005821278	2026-01-21 23:49:21.010	07 21 50.775360	+21 57 51.54840	13.76	93.71
0005821279	2026-01-21 23:50:39.011	07 21 50.752080	+21 57 51.45120	68.47	-52.89
0005821280	2026-01-21 23:51:57.010	07 21 50.724480	+21 57 51.54120	63.08	-12.27
0005821281	2026-01-21 23:53:15.011	07 21 50.694720	+21 57 51.54120	27.66	-61.62
0005821282	2026-01-21 23:54:33.010	07 21 50.666400	+21 57 51.58800	12.27	-64.16
0005821283	2026-01-21 23:55:51.011	07 21 50.640960	+21 57 51.71760	36.96	16.14
0005821284	2026-01-21 23:57:09.010	07 21 50.612400	+21 57 51.75360	18.24	2.85
0005821285	2026-01-21 23:58:27.011	07 21 50.585520	+21 57 51.71400	22.91	-86.01
0005821286	2026-01-21 23:59:45.010	07 21 50.559840	+21 57 51.80040	44.26	-48.85
0005821287	2026-01-22 00:01:03.011	07 21 50.530320	+21 57 51.85800	12.22	-40.47
0005821288	2026-01-22 00:02:21.010	07 21 50.509200	+21 57 52.00200	97.02	54.34
0005821289	2026-01-22 00:03:39.011	07 21 50.479680	+21 57 51.98760	64.97	-9.23
0005821290	2026-01-22 00:04:57.010	07 21 50.452800	+21 57 51.99480	69.65	-51.18
0005821291	2026-01-22 00:06:15.011	07 21 50.426640	+21 57 52.04880	84.36	-46.30
0005821292	2026-01-22 00:07:33.010	07 21 50.397600	+21 57 52.09920	59.00	-45.00
0005821293	2026-01-22 00:08:51.011	07 21 50.366880	+21 57 52.01280	10.27	-180.48
0005821294	2026-01-22 00:10:09.010	07 21 50.341200	+21 57 52.10280	31.66	-139.54
0005821295	2026-01-22 00:11:27.010	07 21 50.318160	+21 57 52.27920	89.77	-12.17
0005821296	2026-01-22 00:12:45.010	07 21 50.278320	+21 57 52.39800	-85.82	57.62
0005821297	2026-01-22 00:14:03.011	07 21 50.257440	+21 57 52.26480	2.35	-124.56

Right ascension (α) and declination (δ) are the measured equatorial coordinates in the J2000 reference frame. $\Delta(\alpha \cos \delta)$ and $\Delta\delta$ denote the astrometric O-C residuals relative to the JPL ephemeris solution for Kallichore (544) (jup347_merged.DE442), computed in the topocentric frame of the observer.

References

- [1] Kervella, P., Thévenin, F., Di Folco, E. & Ségransan, D. The angular sizes of dwarf stars and subgiants. Surface brightness relations calibrated by interferometry. *Astron. Astrophys.* **426**, 297–307 (2004).