Upcoming Occultations by *Lucy* **Targets.** B. A. Keeney^{1,2}, M. W. Buie¹, H. F. Levison¹, and the *Lucy* occultation team. ¹Solar System Science & Exploration Division, Southwest Research Institute, 1050 Walnut St., Suite 300, Boulder, CO 80302, USA; ²brian.keeney@swri.org.

Introduction: NASA's *Lucy* mission will be the first spacecraft to visit Jupiter's Trojan asteroids [1,2]. Occultations by *Lucy*'s prime mission targets have been crucial in characterizing their sizes and shapes, as well as searching for satellites [6-11]. Here we present a list of upcoming occultations by *Lucy* mission targets before the first Trojan encounter in August 2027.

Methods: We searched for upcoming occultations of stars with *Gaia* G < 14 by *Lucy*'s Trojan targets. The magnitude limit was chosen to ensure reasonable SNR observations with 20- to 40-cm telescopes in exposure times of ~500 ms, and the ephemerides used are consistent with all previous occultation astrometry [4-8,10]. This list was further filtered to keep only the occultations that intercept pre-defined regions of interest with a maximum Sun altitude of -12° and a minimum stellar altitude of 20° at event time.

Results: The table below lists 17 occultations of bright stars by *Lucy* targets between August 2023 and May 2027. Three occultations by the (617) Patroclus-Menoetius binary are listed, but approximately 20 in 2026 have been omitted for clarity, observable primarily from the US, South America, and Europe. Since *Lucy*'s Patroclus-Menoetius encounter does not occur until March 2033 [1], we prioritized identifying

good occultations by Lucy's other Trojan targets.

There are only two upcoming occultations by (15094) Polymele that are suitable for detecting its satellite [7] again: one in southern California and Baja Mexico in February 2024, and one in Australia in April 2025. There are also only two good opportunities to observe occultations by (21900) Orus: one in the US in January 2024, and one in Europe in February 2026. There are four good occultations by (3548) Eurybates and six good occultations by (11351) Leucus before their *Lucy* encounters.

Acknowledgments: This work is supported by the *Lucy* mission, funded through the NASA Discovery program on contract number NNM16AA08C.

References: [1] Levison, H. F. et al. (2021) *PSJ*, 2, 171. [2] Olkin, C. B. et al. (2021) *PSJ*, 2, 172. [3] Mottola, S. (2020) *PSJ*, 1, 73. [4] Buie, M. W. et al. (2021) *PSJ*, 2, 202. [5] Buie, M. et al. (2021) *AGU Fall Meeting Abstracts*, id. P32B-02. [6] Keeney, B. et al. (2021) *AGU Fall Meeting Abstracts*, id. P32B-03. [7] Buie, M. et al. (2022) *AAS DPS #54*, id. 512.03. [8] Keeney, B. et al. (2022) *AAS DPS #54*, id. 512.04. [9] Mottola, S. (2023) *PSJ*, 4, 18. [10] Buie, M. W. et al. (2023) *This conference*. [11] Levison, H. F. et al. (2023) *This conference*.

Object	UT Date	G	Speed	Moon	Moon	Regions
		(mag)	(km/s)	Elon. (°)	Phase	
Patroclus-Menoetius	2023-08-10 03:13	13.2	14.7	109	0.33	South Africa
Patroclus-Menoetius	2023-09-22 13:33	11.7	10.8	50	0.47	Australia
Leucus	2023-11-28 06:46	13.5	6.5	60	0.99	South America
Eurybates	2023-12-02 19:06	13.4	5.3	9	0.72	Australia
Orus	2024-01-09 02:12	13.6	16.8	151	0.08	US
Polymele	2024-02-26 13:07	12.2	15.3	44	0.98	US, Mexico
Eurybates	2024-03-25 10:48	13.7	6.0	54	1.00	US
Leucus	2024-04-27 19:43	12.2	13.8	134	0.86	Europe
Patroclus-Menoetius	2024-08-11 10:48	13.4	5.2	147	0.39	US
Eurybates	2024-10-25 02:46	12.3	33.9	36	0.42	Europe
Leucus	2025-03-15 18:16	10.6	16.5	33	0.98	Australia
Polymele	2025-04-22 09:36	11.2	10.8	149	0.36	Australia
Orus	2026-02-10 02:23	11.9	10.9	58	0.45	Europe
Leucus	2026-04-25 02:07	14.0	15.3	54	0.61	US, South America
Eurybates	2026-05-16 10:09	11.9	11.7	147	0.00	Australia, New Zealand
Leucus	2027-03-15 18:32	12.0	6.6	140	0.51	Japan
Leucus	2027-05-12 10:17	9.9	17.3	89	0.41	Australia