nature astronomy

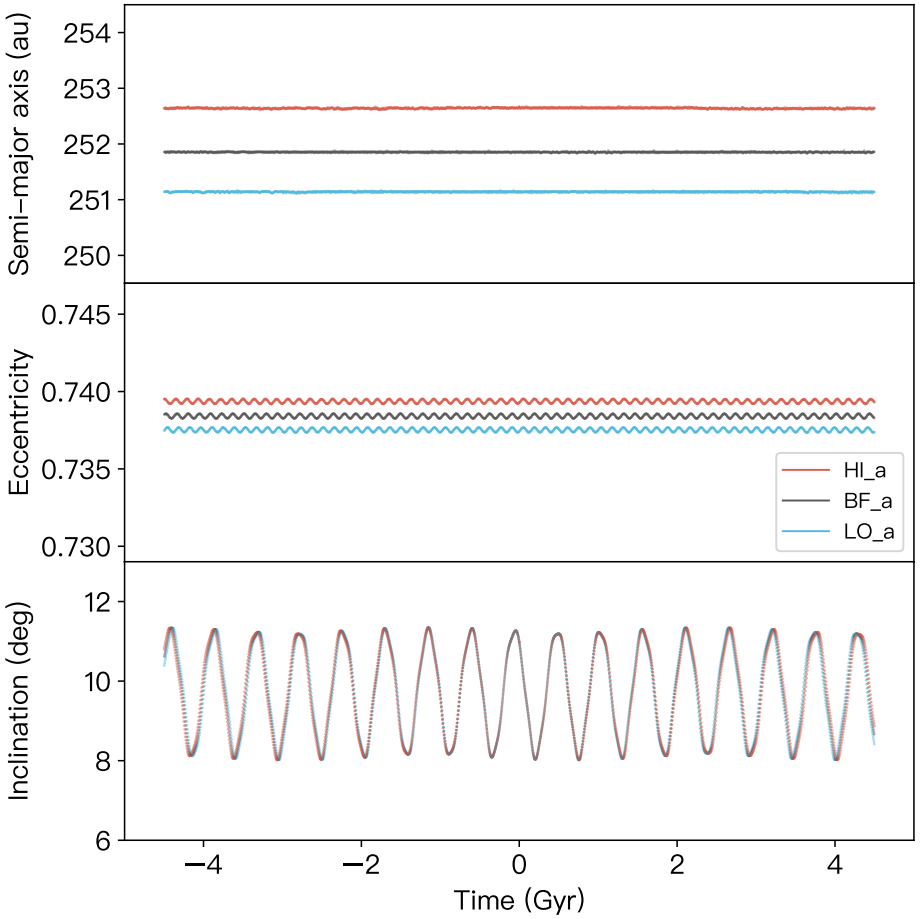
Supplementary information

https://doi.org/10.1038/s41550-025-02595-7

Discovery and dynamics of a Sedna-like object with a perihelion of 66 au

In the format provided by the authors and unedited

Supplementary Information



Supplementary Figure 1: Orbit evolution of Ammonite. The nominal orbit of Ammonite (black line, labeled BF_a) and two clones (blue line: lowest a (labeled LO_a), red line: highest a (labeled HI_a)) over forward and backward 4.5 Gyr simulations. Overall, the orbits are remarkably stable with mean variations in both the semi-major axis and eccentricity of less than 1%. The clones' inclination oscillates between 8 and 11 degrees.

Supplementary Table 1: Observations used for Ammonite in this study

Time (Midpoint, UT)	Filter	Exposure Time (s)	Comment
FOSSIL II Observations			
2023 03 18.509265	EB-gri	270	Precovery
2023 03 18.565634	EB-gri	270	Precovery
2023 03 19.500359	EB-gri	270	Precovery
2023 03 19.556527	EB-gri	270	Precovery
2023 03 19.612552	EB-gri	270	Precovery
2023 03 20.493074	EB-gri	270	Precovery
2023 03 20.549266	EB-gri	270	Precovery
2023 03 20.605338	EB-gri	270	Precovery
2023 05 16.500175	r	270	Discovery, $M_{lim} = 25.0$
2023 05 16.556109	r	270	Discovery
2023 05 16.612008	r	270	Discovery
2023 08 15.321948	r	380	Recovery
2023 08 16.317437	r	380	Recovery
CFHT DDT Follow-up observations			
2024 07 03.258772	w	380	
2024 07 03.288204	w	380	
2024 07 03.339364	w	380	
2024 07 04.260762	w	380	
2024 07 04.372172	w	380	
2024 07 04.404959	w	380	
Archival Observations			
2014 05 04.390754	VR	300	DECam Archive
2014 05 05.244363	VR	300	DECam Archive
2021 06 06.122460	VR	470	DECam Archive
2021 06 07.110407	VR	470	DECam Archive

Note: The weather condition on the discovery night was unstable. The seeing was $0.8'' \pm 0.2$.