EPSC Abstracts
Vol. 8, EPSC2013-853, 2013
European Planetary Science Congress 2013

Origami NanoSat Telescopes: Planetary Astronomy's Future unfolds

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Abstract

We will present a concept to develop a key technology to expand the application of NanoSats to astronomy. The NanoSat size intrinsically constrains the aperture diameter of an onboard telescope to a few centimeters; consequently it limits the sensitivity of the instruments and the scientific return of the mission. An obvious but challenging solution is to encapsulate a deployable telescope in a NanoSat platform and deploy it in space after launch. A revolutionary advance is to add state-of-the-art wavefront sensing and control to a large deployable aperture, and then combine this with excellent pointing stability on such a small platform. We focus this study on a few significant science drivers, which appear to be the most beneficial to the planetary science science decadal survey, the astrophysics decadal survey NASA Strategic goals and plans, and will drive the design of the satellite.