

[Start](#) | [Author Index](#) | [View Uploaded Presentations](#) | [Meeting Information](#)

2015 GSA Annual Meeting in Baltimore, Maryland, USA (1-4 November 2015)

Paper No. 308-16

Presentation Time: 9:00 AM-6:30 PM

SEARCH FOR SATELLITES AT CERES: UPPER LIMITS OF DETECTION FROM DAWN'S FRAMING CAMERA

[MCFADDEN, Lucy A.](#)¹, SKILLMAN, David R.², CARSENTY, Uri³, SCHROEDER, Stefanus³, HELLMICH, Stephan³, LI, Jian-Yang⁴ and MEMARSADEGHI, Nargess¹, (1)NASA, Goddard Space Flight Center, 8800 Greenbelt RD, Greenbelt, MD 20771, (2)NASA, Goddard Space Flight Center, Greenbelt, MD 20771, (3)DLR, Berlin, Germany, (4)Planetary Science Institute, Tucson, AZ, lucy.mcfadden@nasa.gov

Hundreds of asteroids have small secondary satellites or are double, or even multiple body systems; yet Ceres doesn't and isn't. Dwarf planet Pluto has five satellites yet dwarf planet Ceres has none. Ground-based and space-based telescopic searches have yielded ever-decreasing limits on the size of any small secondary bodies gravitationally bound to Ceres. The Dawn project's satellite working group conducted a satellite search during approach to Ceres searching close to the limb where previous searches could not. Images acquired for optical navigation and rotational characterization were also searched. More than 448 images were examined for evidence of moving objects gravitationally bound to Ceres during the dedicated satellite search at range of ~145,000 km from Ceres, and phase angle of 18°. No moving objects associated with Ceres were detected. The search extended down to Ceres' limb (previous searches went to 15,000 km above the limb) and extended the upper limit for the non-detection to 30 +/- 6 and 45 m +/- 9 m radius for two effective exposure times (114s and 19s respectively). Previous upper limits to detection were in the 1-2 km range from Hubble Space Telescope observations. The Dawn mission's search reduced the detection limit by two orders of magnitude. Why some asteroids have satellites and others don't is the subject of dynamical speculation.

Handouts

[GSA2015-LMcF.pdf](#) (9.4 MB)

Session No. 308--Booth# 353

[T172. Geology of Dwarf Planets: First Results from NASA's Dawn Mission to Ceres \(Posters\)](#)

Wednesday, 4 November 2015: 9:00 AM-6:30 PM

Exhibit Hall (Baltimore Convention Center)

Geological Society of America *Abstracts with Programs*. Vol. 47, No. 7, p.784

© Copyright 2015 The Geological Society of America (GSA), all rights reserved. Permission is hereby granted to the author(s) of this abstract to reproduce and distribute it freely, for noncommercial purposes. Permission is hereby granted to any individual scientist to download a single copy of this electronic file and reproduce up to 20 paper copies for noncommercial purposes advancing science and education, including classroom use, providing all reproductions include the complete content shown here, including the author information. All other forms of reproduction and/or transmittal are prohibited without written permission from GSA Copyright Permissions.

[Back to: T172. Geology of Dwarf Planets: First Results from NASA's Dawn Mission to Ceres \(Posters\)](#)

[<< Previous Abstract](#) | [Next Abstract](#)