

Announcing the Final Examination of Andrew Malfavon for the degree of Master of Science in Physics

Date: March 5, 2020

Time: 8:00 a.m.

Room: PSB 160

Dissertation title: Space weathering simulation trends on carbonaceous chondrites

Abstract:

Space weathering on primitive asteroids is an ongoing area of research. Brighter S-type asteroids and their corresponding meteorites, ordinary chondrites, have well characterized space weathering effects. The generally darker primitive asteroids and their less common corresponding meteorites, carbonaceous chondrites, have shown various, sometimes disagreeing results in laboratory simulations. Extensive experiments simulating solar wind exposure by Lantz et al. 2017 and Nakamura et al. 2019 showed complex trends on different types of meteorite samples. Thompson et al. 2019 simulated micrometeorite impacts on CM meteorites. Results from the Japanese sample return mission Hayabusa2 to asteroid Ryugu show an agreement with trends found by both Thompson et al. 2019 and Nakamura et al. 2019. Various laboratory simulations of carbonaceous chondrites were analyzed to determine if certain experimental conditions were leading to disagreeing results. Preparation of the sample (powder or pellet or chip) and type of space-weathering being simulated (solar wind or micrometeorite bombardment) were the main differences in these experimental setups. There appears to be no clear trend for these space-weathering results, suggesting the experiments on carbonaceous chondrites may not be accurately representing what is happening to their primitive asteroid counterparts.

Outline of Studies:

Major: Physics

Educational Career:

B. S. Chapman University, California, 2016

Committee in Charge:

Dr. Humberto Campins (Chair)

Dr. Yan Fernandez

Dr. Kerri Donaldson Hanna

The public is welcome to attend.