Contribution ID : **128** Type : **Oral**

Grazing Fireballs and What They Can Tell Us About Our Dynamic Solar System

Extremely long-lived fireball events have been described previously in scientific literature, the first of which being the Great Daylight Fireball of 1972 (Ceplecha, 1979; 1994). Since then, there have been several similar grazing events reported. In just four years of operation of the Desert Fireball Network (DFN), the largest fireball network in the world, we have recorded two skipping events. One of which covered over 1300 km before returning to space. These events are incredibly interesting for numerous reasons: they are natural aerobraking experiments, they push the limits of our understanding of how to accurately model the atmospheric passage of meteoroids, and close encounters like these events may play a role in diffusing different planetary materials throughout the solar system. There are three situations that can occur when an object has a grazing encounter with the Earth's atmosphere: the object has a high amount of energy when it impacts the atmosphere allowing it to successfully escape back to interplanetary space, the object has a low total energy and it begins to graze the atmosphere but does not have sufficient energy to escape and either fully ablates or falls to the surface, and finally the object could have the 'Goldilock's energy' and just barely escape the atmosphere but be captured into a geocentric orbit. The events observed by the DFN fall into the first two categories described respectively.

Primary author(s) : Mr SHOBER, Patrick (Curtin University - Space Science & Technology Centre); Mr JANSEN-STURGEON, Trent (Curtin University - Space Science & Technology Centre); Mr CLARK, David L. (Department of Physics and Astronomy, University of Western Ontario); Dr DEVILLEPOIX, Hadrien A.R. (Curtin University - Space Science & Technology Centre); Dr TOWNER, Martin C. (Curtin University - Space Science & Technology Centre); Dr SANSOM, Eleanor K. (Curtin University - Space Science & Technology Centre); Dr BLAND, Phil A. (Curtin University - Space Science & Technology Centre); Mr CUPAK, Martin (Curtin University - Space Science & Technology Centre); Dr HOWIE, Robert (Curtin University - Space Science & Technology Centre); Mr HARTIG, Benjamin A.D. (Curtin University - Space Science & Technology Centre)

Presenter(s) : Mr SHOBER, Patrick (Curtin University - Space Science & Technology Centre)