**SEMINAR**

**DEPARTMENT OF EARTH SCIENCES**

**DALHOUSIE UNIVERSITY**

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# "Cosmic Impacts and Their Effect on Planetary Atmospheres and Surfaces"

**Thursday, March 21, 2019**

**11:30 a.m.**

**Milligan Room, 8th Floor Biology-Earth Sciences Wing,**
**Life Sciences Centre, Dalhousie University**

**COFFEE AND DOUGHNUTS WILL BE AVAILABLE IN THE MILLIGAN ROOM BEFORE THE SEMINAR**

# Cosmic Impacts and Their Effect on Planetary Atmospheres and Surfaces

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Cosmic collisions have played a crucial role in the formation and evolution of the Solar System, and still remain one of the most important physical processes. Impacts release tremendous amounts of energy that could have profound effects on both the surface and interior of the target body, as well as its atmosphere, if one is present. The readily recognizable evidence of cosmic collisions comes in the form of impact craters, which are the most ubiquitous geological features on solid planetary bodies. Planetary atmospheres do not retain scars of impacts; however, when a sufficiently large and fast meteoroid enters an atmosphere, sputtering, ablation and formation of shock waves might occur under the right conditions. Additionally, while a typical meteoroid may affect the chemistry of the localized region of atmosphere, giant impacts have the potential to induce long term chemical modification of atmosphere. On Earth, the effects produced by large meteoroids as they penetrate the atmosphere could pose a significant hazard to humans and infrastructure. The famous Tunguska event of 1908, and the more recent spectacular impact and subsequent airburst of the Chelyabinsk bolide in 2013 served as a sober reminder of the destructive potential of extraterrestrial bodies. This talk will provide an insight into the impact phenomena, from shock waves generated by meteoroids entering the Earth's atmosphere and the assessment of near-Earth objects (NEO) hazard, to the formation of impact craters on the solid bodies in the Solar System.

**Short bio:** Dr. Silber earned her PhD. in Physics and Planetary Science at Western University in 2014. She held two postdoctoral fellowships, one at Western University (2014-16) and another, funded by NSERC, at Brown University (2016-18). She now works as a Defence Scientist at Defence Research & Development Canada in Dartmouth, NS. Dr. Silber's research interests include shockwave physics in the context of planetary impacts (meteoroids and asteroids); shock induced chemical and physical phenomena during extra-terrestrial object entry into the upper atmosphere; evolution and modification of solid planetary surfaces as a result of impacts; numerical modeling (hydrocode) of impact processes; infrasound (acoustic) monitoring of natural and anthropogenic phenomena; planetary defense; evolution and composition of small bodies in the solar system, and delivery of exogenous material to the Earth.