



Chemical & Physical Sciences
UNIVERSITY OF TORONTO
MISSISSAUGA

COLLOQUIUM
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12:00 NOON – 1:00 PM
IB280

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**Googling Earth and Ogling Planets:
Transforming geomorphology in
Earth Sciences**

In the hydrocarbon extraction industry there is a need to predict the three dimensional arrangement of resource-filled sandstone bodies and flow-retarding mudstones. In the subsurface and outcrops, this is primarily done using vertical cross sections from which the plan-view dimensions must be inferred or interpolated. Google Earth allows direct imaging of the plan-view dimensions of sedimentary bodies, such as channels and bars in rivers, and this dimensional information can be used to model or predict the complexity of subsurface reservoirs. Empirical, or physics-based scaling relationships, which may be made by examining a large number of depositional systems, can be used to compare systems of widely different scales (e.g. Mississippi River versus the Credit River).

Newer seismic imaging technology enable acquisition of 3D earth cubes (3D seismic surveys) that can reveal the paleogeography of ancient rivers deposits, showing channels and point bars in sediments or sedimentary rocks that may be millions of hundreds of millions of years old. This is termed seismic geomorphology.

Remote sensing on planets, including Mars reveals analogous river and delta deposits, over 3 billion years old, which indicate water flowed freely on Mars in its early history and may have harboured ancient life.