



# Department of Geology Seminar Series Presents

**Dr. Penny Morrill**  
Department of Earth Sciences  
Memorial University

*Sites of Serpentinization and the Search for  
Extra-Terrestrial Life*

**TUESDAY, DECEMBER 17 - 1:00PM**  
Science 411

*Everyone is welcome to attend!*



**GEOLOGY**  
FACULTY OF SCIENCE

*Sites of Serpentinization and the Search for Extra-Terrestrial Life*

**Abstract**

If there is (or was) life on another planet or moon in our solar system, then we would likely find evidence of it in the subsurface of those bodies. Organisms in the subsurface (below ice and or regolith) would be protected from the harmful effects of UV radiation and insubstantial atmospheres. The subsurface also provides a location where liquid water may be present. The likelihood of finding evidence for life will be higher in locations where chemical energy for life is available, life's biosignatures are preserved, and biosignatures can be detected at or near the surface. These factors must be considered when selecting locations for missions searching for extra-terrestrial life. As such, the next generation of planetary scientists must consider sites of serpentinization as targets for the search for life on other planets and moons in our solar system. This talk will discuss terrestrial sites of serpentinization as analogues for ultramafic planets and moons with subsurface liquid water, covering research on the habitability, available potential energy, metabolisms detected, life found, and surface biosignature detection and preservation at sites of serpentinization on Earth.

**Biography**

Dr. Penny Morrill is a Professor in the Department of Earth Sciences at Memorial University of Newfoundland. Dr. Morrill received her PhD from the University of Toronto, where she studied the biodegradation of dry-cleaning fluids and other solvents in groundwater. Subsequently, she has worked at the Carnegie Institution of Washington, McMaster University, and the Institute for the Study of Earth's Interior, Japan, studying organic synthesis and degradation, and the isotopic fractionation associated with these processes. At Memorial University Dr. Morrill's research group has focused on using biogeochemistry to solve environmental problems such as climate change mitigation, remediation of acid mine drainage, and prevention of reservoir souring. Dr. Morrill's research group also uses biogeochemistry to study life and its preservation at sites of serpentinization.