

Earth Sciences Colloquium Series

Presents



GEOLOGICAL
ASSOCIATION OF CANADA
ASSOCIATION
GÉOLOGIQUE DU CANADA

2023 W.W. Hutchinson Medalist

Dr. James Kirkpatrick

Associate Professor, McGill University

Date: Tuesday, March 26, 2024

Time: 1:30 PM

Location: BGS 1053



Reading the trackways of tectonic faults

When rocks slide past each other in tectonic faults they produce grooved and striated surfaces that create an archive of the movement, similar to bedrock striations that form under a glacier. In faults, these surfaces are called slickensides and the grooves are called slickenlines. They are trackways that record not only the direction of fault movements in the geologic past, but also record the deformation processes and conditions active on a fault plane during slip at depth in the crust. In this talk, I will explore how information can be extracted from the geometry of slickensides that allows us to investigate both fault strength and the physics of earthquake ruptures. I will present field observations of exposures of ancient, exhumed faults from the deserts of the western USA and modern plate boundaries including the subduction megathrust offshore of Costa Rica. This work reveals that there are aspects of the geometry of fault slickensides that are common to faults in all tectonic settings and rock types, and which control both the long-term strength of the faults as well as the characteristics of the earthquakes they host.



Western
Science