

Dr. Karol Faehnrich

Title: Tectonic Evolution of the Northern Margin of North America

Abstract: The northern margin of North America records a protracted history of rifting, passive margin development, and accretion of continental fragments. Contrasting tectonic models disagree on the history of Neoproterozoic rifting, the role of strike-slip displacement during Paleozoic terrane accretion and the Cretaceous opening of the Canada Basin. In this talk, I test these models by investigating stratigraphy and boundaries between displaced terranes. I present a new model for late Ediacaran to early Cambrian rifting on northern Ellesmere Island, Canada. I suggest that rifting led to the separation of the North Slope subterrane, preceding early Paleozoic passive margin development and displacement of peri-Laurentian terranes. I then reconstruct stratigraphy along the Porcupine Fault System, which marks the current boundary between the North Slope subterrane and Laurentia. I define a new succession of strongly deformed late Tonian sedimentary deposits and propose that they represent a displaced peri-Laurentian crustal fragment. Finally, I integrate detailed mapping with U/Pb calcite dating to determine the timing of this displacement. The ca. 119 Ma age of calcite veins indicates Early Cretaceous deformation, supporting models that involve terrane translation rather than rotation during the formation of the Canada Basin. Together, this work supports the presence of a long-lived strike-slip fault system along the entire length of the northern edge of North America.



Bio: Dr. Karol Faehnrich is a Researcher at Uppsala University in Sweden. He graduated from AGH University in Kraków and completed his PhD at Dartmouth College in the United States in 2023. Afterwards, he was a postdoctoral researcher at the Adelaide University in South Australia, investigating sea-level changes during the appearance of the Ediacaran Biota. In Uppsala, he is reconstructing evolution of the continental margin of northern Greenland, one of the most remote places in the world.