M.Sc. THESIS DEFENCE

by

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"Thermal History of the Labrador Rifted Margin:
Insights from Apatite and Zircon (U-Th)/He and Apatite Fission Track Thermochronology"

PLACE: ***VIRTUAL DEFENCE: Via Zoom Link***

DATE: *Thursday, April 1, 2021*

TIME: *11:00 a.m.*

EXAMINING COMMITTEE:

Dr. Alexander Peace	*McMaster University*	*External Examiner*
Dr. Isabelle Coutand	*Dalhousie University*	*Co-Supervisor*
Dr. Deanne van Rooyen	*Cape Breton University*	*Co-Supervisor*
Dr. John Gosse	*Dalhousie University*	*Reader*
Dr. Djordje Grujic	*Dalhousie University*	*Reader*
Dr. Yana Fedortchouk	*Dalhousie University*	*Chair*

ABSTRACT

The Labrador margin formed from Mesozoic rifting, breakup and seafloor spreading between eastern Labrador and southwest Greenland, producing the Labrador Sea. This study aims to quantify the thermal rift-related history of the upper continental crust of Hopedale and Saglek blocks of the Labrador margin using apatite and zircon (U-Th)/He (AHe and ZHe) and apatite fission track (AFT) dating methods sensitive to closure temperatures between ~40–200 ^{o}C. This study presents new AHe, ZHe and AFT data from 32 bedrock samples distributed along four transects perpendicular to the coast at the latitudes of Saglek, Nain, Hopedale, and Makkovik, Labrador. Cooling ages range from 18.0 – 937.5 Ma (AHe), 99.9 – 258.9 Ma (AFT), and 5.4 – 1612.75 Ma (ZHe). Temperature-time paths produced in *HeFTy* modelling software indicate episodes of rapid cooling initiating between 211.23 – 111.71 Ma, continuous cooling initiating between 100 – 150 Ma and cooling initiating between 19 – 66 Ma in northern transects.