Groundbreaking research changing geological map of Canada

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Researchers exploring a remote terrain in Arctic Canada have made discoveries that may rock the world of Canadian geology.

Geologists from the University of Alberta have found that portions of Canada collided a minimum of 500 million years earlier than previously thought. Their research, published in the American journal *Geology*, is offering new insight into how the different continental fragments of North America assembled billions of years ago.

Lead researcher Michael Schultz, a graduate student at the U of A, took advantage of a rare opportunity to explore the Queen Maud block of Arctic Canada, a large bedrock terrain that is said to occupy a keystone tectonic position in northern Canada.

Because of its remote location, the Queen Maud block has remained understudied - until now. "In terms of trying to figure out how Canada formed, this block held a lot of secrets," said Schultz.

The U of A team reached the rugged Northern Canadian location in helicopters and discovered - through field work and lab analysis - that the sedimentary basins within the terrain, and the age and timing of high-temperature metamorphism of the rocks found there, challenged previous models.

"Every time we did an analysis, it gave us a new piece of information that was nothing we were expecting, based on what was known in the

geological community," said Schultz.

Schultz credits cutting-edge technology only recently developed in the department of Earth and Atmospheric Sciences at the U of A with the ability to acquire large amounts of data from rocks of the Queen Maud block in record time. The technique, known as in-situ laser ablation, substantially reduces the preparation time for geochronology, the process of dating rocks and minerals.

As the Canadian Arctic starts to gain attention nationally and globally, Schultz believes the time is right to push for more geological exploration in the region.

"All this newly discovered geological information means that large portions of Northern Canada are still very poorly understood, and in fact may contain rocks that nobody knows about. This has many implications, both academically and for mineral resources," said Schultz. "Given the remote nature of these areas, investigation has to be initiated and funded by federal, provincial or territorial governments, in cooperation with universities for facilities and additional expertise."

Source: University of Alberta