# OCGC Seminar

## Paleoproterozoic banded iron formation deposition controlled by Milankovitch forcing


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**Thursday, March 7th, 2019 11:30 AM**
**Carleton University**
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**Room 3120 Herzberg labs**

**Jeudi le 7 mars 2019, 11h30**
**Carleton University**
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Banded iron formations (BIFs) were widely deposited in the Neoarchean to early Paleoproterozoic oceans, between 2.8 and 2.4 Ga. Their formation has typically been linked to hydrothermal plume activity, continental growth and the rise of oxygen in the ocean and atmosphere. However, very little attention has been paid to climate variability and its potential role in the formation of BIFs. Climate oscillations on the thousands to millions of years scale known as Milankovitch forcing must have been operative at that time and may explain the rhythmic layering observed in BIFs. This hypothesis has never been fully tested, partially due to the unknown depositional rate of BIF.

In this study, we carried out high-precision, high-accuracy TIMS U-Pb zircon dating of four ash intervals interbedded in the Paleoproterozoic Kuruman BIF, South Africa to precisely determine the depositional rate. We combined these results with cyclostratigraphic analysis of rhythmic alternations in the weathering profile from field exposures which are laterally consistent over 250 km. Based on our spectral analysis results and precise U-Pb ages, we hypothesize these patterns are related to orbital forcing.


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