# CoE-MaSS weekly seminar series

**THE DST-NRF CENTRE OF EXCELLENCE IN MATHEMATICAL AND STATISTICAL SCIENCES (CoE-MaSS) WOULD LIKE TO PRESENT A SEMINAR BY**

## Prof Jeffrey S. Racine

***(Department of Economics and Graduate Program in Statistics, McMaster University)***

*"Direct Nonparametric Conditional Quantile Estimation"*

Thursday, 21 April 2016
10h30-11h30

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**Broadcast live from:**
Videoconferencing Facility, 1st Floor
Mathematical Sciences Building, Wits West Campus

**How to connect to this seminar remotely:**
You can connect remotely via Vidyo to this research seminar by clicking on this link:
http://wits-vc.tenet.ac.za/flex.html?roomdirect.html&key=y0SSOwFsvsidbzg4qFdWXvvQtyI
and downloading the Vidyo software before the seminar.
You must please join in the virtual venue (called *"CoE Seminar Room (Wits)"* on Vidyo) strictly between **10h00-10h15**. No latecomers will be added.

**Important videoconferencing netiquette:**
Once the seminar commences, please mute your own microphone so that there is no feedback from your side into the virtual room. During the Q&A slot you can then unmute your microphone if you have a question to ask the speaker.

**Title:**
Direct Nonparametric Conditional Quantile Estimation

**Presenter:**
Prof Jeffrey S. Racine, Department of Economics and Graduate Program in Statistics, McMaster University, racinej@mcmaster.ca

**Abstract:**
Nonparametric conditional cumulative distribution function (CDF) estimation has emerged as a powerful tool having widespread potential applications, which has led to a literature on indirect estimators of conditional quantile functions that are obtained via inversion of the nonparametrically estimated conditional CDF. Other nonparametric estimators of conditional quantiles that are based on an alternative characterisation of the quantile (i.e., as the function that minimises the expectation of the check function) have also appeared in the literature. In this paper, we propose a novel direct nonparametric approach. Relative to its indirect peer and the check function-based method, our proposed estimator has a simple closed-form expression. We also show that under certain conditions, our estimator is more efficient in tail regions when the data has unbounded support (our theoretical results underscore this property). Theoretical underpinnings are developed, a method for data-driven smoothing parameter selection is provided, and Monte Carlo simulations and empirical examples are considered. Two empirical examples illustrate how the proposed approach can deliver more reasonable quantile and quantile derivative estimates than its indirect counterpart and the check function-based method, particularly in tail regions.