

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 Kathleen (Kathy) Driver

(Emeritus Professor of Mathematics
University of Cape Town)

“ORTHOGONAL POLYNOMIALS AND INTERLACING OF ZEROS”

Friday, 27 November 2015
10h30-11h30



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=y0SSOwFsvsidbzg4qFdWXvvQtyl>
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:

Orthogonal Polynomials and Interlacing of Zeros

Presenter:

Professor Kathy Driver; Emeritus Professor of Mathematics, University of Cape Town, South Africa; kathy.driver@uct.ac.za

Abstract:

The interlacing of zeros of two polynomials of consecutive degree in an orthogonal sequence is a classical result that has important applications to Gauss quadrature. Stieltjes extended the concept of interlacing to zeros of two orthogonal polynomials of non-consecutive degree. In this more general context, common zeros of the two polynomials involved (if there are any) play a critical role when interlacing of zeros is under consideration.

This talk will focus on sequences of Laguerre polynomials $\{L_n^{(\alpha)}\}_{n=0}^{\infty}$, α fixed, $\alpha > -1$. Recent developments on the interlacing of zeros of orthogonal polynomials from different sequences within this classical family will be discussed and the connection between the interlacing of zeros and the existence of common zeros will be highlighted. The mixed three term recurrence relations satisfied by Laguerre polynomials corresponding to different values of the parameter α are used to derive bounds for the largest and smallest zeros of Laguerre polynomials. We discuss the interlacing of zeros, and the co-primality, of the quasi-orthogonal Laguerre sequences $L_n^{(\alpha)}\}_{n=0}^{\infty}$ for α fixed, $-2 < \alpha < -1$.