MaSS
DST-NRF CENTRE OF EXCELLENCE IN MATHEMATICAL & STATISTICAL SCIENCES

CoE-MaSS weekly seminar series

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

Prof Jacek Banasiak

(School of Mathematics, Statistics and Computer Science, UKZN)

"Dynamical systems on networks - on the crossroads of discrete and continuous mathematics"

Friday, 3 July 2015
10h30-11h30
Videoconferencing Facility, 1st Floor
Mathematical Sciences Building, Wits West Campus

Tea will be served in the MSB Staff Room on the Upper Ground Floor from 09h45-10h30 for those that are attending the seminar at Wits.

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 can join in the virtual venue (called "CAM Seminar Room" on Vidyo) to check your settings beforehand, from 10h00-10h15.

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:
Dynamical systems on networks - on the crossroads of discrete and continuous mathematics

Presenter:
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Abstract:
Recently there has been an interest in dynamical problems on graphs, where some evolution operators, such as transport or diffusion, act on the edges of a graph and interact through nodes. One can mention here quantum graphs, diffusion on graphs in probabilistic context, transport problems, both linear and nonlinear, migrations. In this note we shall focus on a more general linear transport and diffusion problems posed on networks consisting of one dimensional domains, which are coupled through transmission conditions between an arbitrary selection of the endpoints of the domains. This allows for communication between domains which not necessarily are physically connected and makes it possible to consider within the same framework not only classical transport and diffusion problems on graphs but also models such as Rotenberg type models describing mutations in dividing cells.

In this talk we address the following problems:
1. Well-posedness of the problems;
2. Conditions under which such generalized models have classical graph representation;
3. The so-called asymptotic state lumping; that is, conditions under which such network problems can be approximated by appropriately constructed system of ordinary differential equations.