



# Applied Mathematics



## CRM-McGill Applied Mathematics Seminar

Nov. 20, 2006, 4:00 pm Monday  
At McGill, Burnside Hall 920

“ Global bifurcations of the Lorenz manifold”

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*Coffee and refreshments will be served after the seminar*

### Abstract:

The Lorenz system still fascinates many people because of the simplicity of the equations that generate such complicated dynamics on the famous butterfly attractor. The organisation of the dynamics in the Lorenz system and also how the dynamics depends on the system parameters has long been an object of study. This talk addresses the role of the global stable and unstable manifolds in organising the dynamics. More precisely, for the standard system parameters, the origin has a two-dimensional stable manifold and the other two equilibria each have a two-dimensional unstable manifold. The intersections of these two manifolds in the three-dimensional phase space form heteroclinic connections from the nontrivial equilibria to the origin. A parameter-dependent study of these manifolds reveals an intriguing combinatoric structure of the heteroclinic orbits in terms of their birth and destruction in different homoclinic bifurcations. Joint work with Eusebius Doedel (Concordia University, Montreal) and Bernd Krauskopf (University of Bristol).

