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THE FIELDS INSTITUTE FOR RESEARCH IN MATHEMATICAL SCIENCES

GENERAL RESEARCH SEMINARS IN DYNAMICAL SYSTEMS

SPEAKER:

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On the Topic:

On the Bifurcation Set of $\dot{z} = e^{i\alpha}z + e^{i\pi}z|z|^2 + b\bar{z}^3$

We consider the equation $\dot{z} = e^{i\alpha}z + e^{i\varphi}z|z|^2 + b\bar{z}^3$, where $\alpha \in (-\pi, \pi]$, $\varphi \in [\pi, \frac{3}{2}\pi]$ and $b \in \mathrm{R}^+$. The (b,φ)-plane of this equation is a transformation of the well known A-plane of the *model equation* $\dot{z} = e^{i\alpha}z + Az|z|^2 + \bar{z}^3$, see [A88], [BK80], [Cw90] and [K93]. We discribe how the parameter space (b,φ,α) is structured by surfaces of codimension one bifurcations. These surfaces intersect in curves of codimension two bifurcations, the projections of which onto the (b,φ)-plane form boundaries between regions of topologically different bifurcation sequences under variation of α. These sequences can be obtained from our model by test drilling along α for a given point of the (b,φ)-plane.

It is an open question if there are more than the known boundary lines. The analysis of the bifurcation set can be considered as a step to answer this question. In particular our model casts some light on the nature of the point $(b,\varphi) = (1, \frac{3}{2}\pi)$, corresponding to $A = -i$, where all codimension two curves originate.

Wednesday, September 15, 1993

3:30 pm, room 3018

at

The Fields Institute

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Supported by the **Ministry of Colleges and Universities of Ontario** and the **Natural Sciences and Engineering Research Council of Canada**