



*Institute of Mathematical Research
Department of Mathematics*

GEOMETRY SEMINAR

On the third singlevalued solution of the Bianchi IX cosmological model in vacuum

Professor Robert Conte

LRC Meso, Centre de mathématiques et de leurs applications,
École normale supérieure de Cachan, France & HKU Math

Abstract

The six-dimensional dynamical system $(\log A)'' = A^2 - (B - C)^2$, and cyclically, defined by the Bianchi IX cosmological model in vacuum (see Landau and Lifshitz, The classical theory of fields) is nonintegrable, and the Painlevé test shows that it may admit only three single valued particular solutions. Two of these are known in closed form, and we discuss here various attempts to find the third one as a four-parameter closed form expression. One attempt, building up on dependent variables introduced by Contopoulos *et al.*, could hint at a third Painlevé function, but this is unlikely for physical reasons. A second attempt, in progress, is to assume the missing solution to be a genus two hyperelliptic function and to extend to such functions our subequation method for (genus one) elliptic functions.

Date:	March 24, 2011 (Thursday)
Time:	5:00 – 6:00pm
Place:	Room 210, Run Run Shaw Bldg., HKU

All are welcome