

# Contributed Talks – Additional Abstracts

## Pure Mathematics

*This talk will take place Thursday at 5:00 pm in ESB 18*

- HAMID USEFI (University of British Columbia)

*Enveloping algebras of Lie super-algebras satisfying non-matrix polynomial identities*

It is known that if the enveloping algebra of a Lie algebra  $L$  satisfies a polynomial identity then  $L$  is forced to be abelian (over a field of characteristic zero). We are interested to investigate the same problem for Lie super-algebras. In this talk we shall show how the structure of Clifford algebras can be used to characterize when the enveloping algebra of a Lie super-algebra is Lie solvable, Lie nilpotent, or Lie super-nilpotent. This is joint work with David Riley and Jeff Bergen.

## Applied Mathematics and Mathematical Physics

*This talk will take place Thursday at 5:00 pm in ESB 3*

- AFSANEH BAKHTIARI (Simon Fraser University)

*A dynamical system model of the social influence in a community of drug users*

There is evidence that drug use spreads as an infectious disease, i.e. the rate of new cases depends bilinearly on the number of exciting cases and on the number of susceptible. Thus mathematical models we have developed models the drug-related problems and associates social influence in the drug users community. This model can be adaptable to any epidemiological applications. Our major goal is to understand more deeply the drug use problem and its consequence for society and to answer questions concerning drug use and related costs. The consequence comprise, among many others, the adverse effect of the costs imposed on society by drug related criminality, loss of productivity, infectious disease and by burden of disease and mortality. This is a modified dynamical system of a susceptible infective - removed (S-I-R) model for HIV/AIDS epidemic proposed, at the beginning of the 1990s and recently generalized, to mirror the current epidemics of problematic drug use. Transmission parameters estimated for the model were selected from parameters that represent the HIV epidemic in Italy. Average length of stay in compartment is 5 (hypothesis): 5-10 weeks. This models offer a means of exploring the dynamics of the social influence in a complex community. The current compartmental model has been developed to reproduce the current epidemic of drug use. The goal is to present both qualitative and quantitative analysis by means of simulation to show the potential value of the model for decision-makers. In order for the model to be realistic, the transition parameters should not be taken as constant but should be represented as functions taking into account the history of individuals drug use. This is joint work with Alexander Rutherford.