

國立交通大學應用數學系

學術演講公告

主講人：Dr. Meng-Che Ho (Purdue University)

講題：Groups, Logic, and Languages

時間：109年3月3日(星期二) 下午 14:00 –15:00

Abstract

The interplay between group theory and logic had played a crucial role in both areas for many decades. The most famous questions in this intersection is the word problem proposed by Dehn in 1911. The word problem is shown to be unsolvable in general by Novikov in 1955. However, as a logician, the (un)solvability of a decision problem is only the beginning. For an unsolvable problem, computable structure theory gives a framework to study "how unsolvable" the problem is. On the other hand, for a solvable problem, formal language theory provides a way to study its complexity. We will survey various past and current results as well as some work in progress in these directions. In particular, we will study the linguistic complexity of word problems and geodesic representatives in finitely-generated groups.

主講人：王峰彬教授(長庚大學)

講題：Competition for resources with internal storage in variable habitats

時間：109年3月3日(星期二) 下午 15:00 –16:00

Abstract

Competition for resources is a fundamental topic in theoretical ecology. There has been a lot of mathematical models in competition studies. The simplest competition models neglect differences between individuals, using one ordinary differential equation to govern the dynamics of each species. These population dynamics are coupled to dynamics of one or more resources by assuming a constant quota of nutrient per individual, or equivalently, a constant yield of individuals from consumption of a unit of resource. In fact, quotas may vary, leading to variable-internal-stores models.

Ecologists are interested in the mechanism of coexistence/diversity in competitor communities. In this talk, I first review a mathematical model of two species competing in a well mixed chemostat for one resource that is stored internally. For this simple model, two or more species cannot coexist, a result known as the Competitive Exclusion Principle. After introducing additional factors such as multiple resources, toxin mortality, intraguild predation, and spatially/ temporally variations into the model, we find that coexistence or bistability (where outcomes depend on initial conditions) becomes possible.

This talk is based on my recent works joint with Drs. James P. Grover, Sze-Bi Hsu, Jifa Jiang, King-Yeung Lam, Hua Nie, Junping Shi, and Xiaoqiang Zhao.

地點：(光復校區) 科學一館 223 室

茶會：當天下午 13:30 (科學一館 205 室)

敬請公告 歡迎參加

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