



Dr. Lou Yijun

Research interests include:

- **Applied Dynamical Systems**
- **Differential Equations**
- **Mathematical Epidemiology**
- **Mathematical Biology**

On-going ECS project

Theory of asymptotically periodic systems and its applications to impulsive biological systems

Abstract

Differential equations with impulses arise when describing many evolving processes that are subject to abrupt changes, such as shocks, harvesting, and natural disasters. Some control effects with fixed moment impulses are eventually periodic, that is, the coefficients subject to control have periodic functions as limits. In this case we call the models asymptotically periodic systems, with periodic systems as their limiting systems. We conjecture that the long-term behaviors of solutions for an asymptotically periodic system can be reflected by those of its limiting periodic system. An important aspect of this project is to put this idea onto a rigorous footing.

The results will be used to evaluate the effectiveness of control strategies and design optimal integrated control measures in biological sciences, such as impulsive vaccination, biological resource management with impulsive releasing and harvesting, drug treatment for diseases and so on. This investigation is directly relevant to various novel applications of theories about periodic differential systems and dynamical systems to impulsive differential systems.