

# **COLLOQUIUM**

DEPARTMENT OF MATHEMATICS AND STATISTICS  
OAKLAND UNIVERSITY  
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## **Continuous and Discrete Time Population Models: An introduction to NSFD (nonstandard finite difference) methods**

### **Abstract**

I would like to introduce a numerical method called nonstandard finite difference (NSFD) method that when applied to differential equations will preserve many nice properties of the solutions to the equations. First, I will talk about the exact finite difference methods and the reason behind the concept of NSFD methods. Then I will present many population models as examples, including predator-prey model, Lotka-Volterra competition model, SI and SIS epidemic models, to illustrate the powerful and useful NSFD methods that transform differential equations to difference equations. Possible future research directions will be presented as well.

**Tuesday, Oct 8, 2019**  
**12:00 – 12:50 P.M.**  
**372 Mathematics and Science Center (MSC)**

(Refreshments at 11:30-12:00 PM in the kitchen area adjacent to 368 MSC)