

# 2023 LIAM-NSERC/Mitacs/Sanofi Alliance Summer Symposium Series

## Dynamical Systems with Applications

### Lecture # 3

#### A Differential Equation with a State-Dependent Queueing Delay

#### Lecture By

#### Professor Tibor Krisztin



Tibor Krisztin is a Hungarian mathematician, received his MSc degree in mathematics at the University of Szeged in 1981, the DSc (Doctor of Science) degree from the Hungarian Academy of Sciences in 2000. He is a professor of the Bolyai Institute of the University of Szeged, Hungary. He was (and is) a member of the editorial board of several international journal, including J. Math. Anal. Appl., SIMA J. Math. Anal., co-editor-in chief of the Electronic Journal of Qualitative Theory of Differential Equations. He is a member of the Hungarian Academy of Sciences (2019). His research area is infinite dimensional dynamical systems, delay differential equations, published more than 70 research papers. He received several prizes, including the 2016 Moore Prize for the application of interval analysis, the Széchenyi Prize from the Hungarian State (2018).

### Abstract

We consider a differential equation with a state-dependent delay motivated by a queueing process. The time delay is determined by an algebraic equation involving the length of the queue for which a discontinuous differential equation holds. The new type of state-dependent delay raises some problems that are studied in this talk. We formulate an appropriate framework to handle the system, and show that the solutions define a Lipschitz continuous semiflow in the phase space. The second main result guarantees the existence of slowly oscillating periodic solutions.

**10:30-12:30pm, August 11**

**Refreshment provided before the lecture**

**Kinsmen Building: Room 277**

York University, Keele campus

**Organizer: Jianhong Wu, Judy Kong, Woldegebriel Assefa  
Woldegerima**

