**HUAIPING ZHU**, York University

*Models with delays for the transmission and control of COVID-19*

The ongoing global COVID-19 epidemic poses a huge threat to human wellbeing and public health, waves of outbreaks continue to surge one year after it was declared as a global pandemic. There have been extensive modeling studies for the transmission which have been contributing greatly to inform decision-making. In this talk, I will discuss the role of delays in the modeling and dynamics for COVID-19 and their application in informing decision making. It is well-known that dynamical models with or without delays generate complex asymptotic dynamics through bifurcations. Usually there are two types of delays: one is due to the development or evolution of the virus, like the latency and incubation delays; the other is human but non-viral related, like delays in tracing and testing, quarantine and isolation, treatment due to lack of medical and health resources, or delays due to other social and behaviors in response to the control strategies. I will present examples of modeling with the two types of delays in control and mitigation of the epidemics of COVID-19 with application to inform rapid decision making. Examples of Wuhan and other selected cities will be presented.