College of Arts & Sciences
Department of Mathematical Sciences

Colloquium

Dr. Shigui Ruan

University of Miami

Friday April 6, 2018
Room 140, 60 West Charlton
4:00 – 5:00 pm

Oscillations in an Evolutionary Epidemiological Model of Influenza A Drift

Influenza viruses infect about 5 million people and cause about 500,000 deaths each year around the world, the reasons for the seasonal influenza epidemics are still not clear. There are two types of changes in influenza A viruses: antigenic shift which happens only occasionally but causes pandemics and antigenic drift which occurs all the time and causes the annual influenza epidemics. In this talk, we present an age-structured type evolutionary epidemiological model of influenza A drift, in which the susceptible class is continually replenished because the pathogen changes genetically and immunologically from one epidemic to the next, causing previously immune hosts to become susceptible. Applying our recent established bifurcation theory for abstract semilinear equations with non-dense domain, we show that Hopf bifurcation occurs in the model. This demonstrates that the age-structured type evolutionary epidemiological model of influenza A drift has an intrinsic tendency to oscillate due to the evolutionary and/or immunological changes of the influenza viruses.

Refreshments will be served 3:15 – 3:45 pm in the Faculty & Graduate Student Lounge Room 4118 French Hall West

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