

2023 Shanks Workshop on Advances in Mathematical and Theoretical Biology

March 17 – 19, 2023

Vanderbilt University

Friday, March 17, 2023		
1:00 PM – 5:00 PM	Registration (Stevenson Building 1 – Math Department)	
1:40 PM – 2:00 PM	Opening Remarks: Glenn Webb (Room: 4309)	
2:00 PM – 3:00 PM	Plenary Talk: Shigui Ruan (Room: 4309) <i>Modeling the Growth, Invasion and Competition of Aedes Mosquitoes</i> Chair: Glenn Webb	
	Session 1 (Room:1320) Chair: William Fitzgibbon	Session 2 (Room: 1308) Chair: Joanna Wares
3:15 PM – 3:45 PM	Libin Rong <i>Modeling COVID-19 dynamics: From within-host to between-host</i>	Basile Fornara <i>Study of prion dissemination in brain tissue: A synthetic approach</i>
3:45 PM – 4:15 PM	Xueying (Snow) Wang <i>The Heterogeneous Severity of COVID-19 in African Countries: A Modeling Approach</i>	Ming Zhong <i>Machine Learning of Collective Behaviors from Observation</i>
4:15 PM – 4:45 PM	Seoyun Choe <i>The impact of Travel Frequency on Infectious Disease Dynamics for Multi-Patch Models</i>	Linh Huynh <i>Utilizing Stochastic Fluctuations to Disambiguate Density-Dependent Mechanisms</i>
5:00 PM – 6:00 PM	Plenary Talk: Laurent Pujol-Menjouet (Room: 4309) <i>Neurodegenerative diseases: nice collaboration stories between biologists and mathematician leading to a better understanding of prion and Alzheimer's diseases</i> Chair: William Fitzgibbon	

Saturday, March 18, 2023	
9:00 AM – 4:00 PM	Registration (Stevenson Building 1 – Math Department)
9:00 AM – 10:00 AM	Plenary Talk: Jorge Velasco-Hernandez (Room: 4309) <i>Behaviour change and control and mitigation strategies for epidemic outbreaks</i> Chair: Shigui Ruan

Saturday, March 18, 2023			
	Session 3 (Room:1320) Chair: Laurent Pujou-Menjouet	Session 4 (Room: 1308) Chair: Rachel Leander	Session 5 (Room:1307) Chair: Hayriye Gulbudak
10:15 AM – 10:45 AM	Meredith Greer <i>An Undergraduate Text in Mathematical Epidemiology</i>	Jeffrey Morgan <i>Analysis of an SIR Model Subject to Intermittent Treatment</i>	Yi Sun <i>Kinetic Monte Carlo Simulations of Multicellular Aggregate Self-Assembly in Biofabrication</i>
10:45 AM – 11:15 AM	Jerome Goldstein <i>The influence of Glenn Webb on mathematical finance: Chaos for the Nobel Prize winning Black-Merton-Scholes semigroup on stock options, and a novel Feynman-Kac formula for zero coupon bonds</i>	Yixiang Wu <i>Analysis of the basic reproduction number of reaction-diffusion epidemic models</i>	Chidozie Williams Chukwu <i>On modeling malaria dynamics with seasonal factor</i>
11:15 AM – 11:45 AM	Joanna Wares <i>Reminiscing about a Project that Started at Vanderbilt University</i>	Summer Atkins <i>An Immuno-Epidemiological Model of the Foot-and-Mouth Disease in South African Buffalo</i>	Georgi Kapitanov <i>Role of IL-23 neutralization in psoriasis – insights from a mechanistic PK/PD model and meta-analysis of clinical data</i>
11:45 AM – 1:30 PM	Lunch (on your own)		
1:30 PM – 2:30 PM	Plenary Talk: William Fitzgibbon (Room: 4309) <i>Diffusive Models for the Spread of Infectious Disease</i> Chair: Jorge Velasco-Hernandez		
2:30 PM – 3:30 PM	Coffee Break and Poster Session (Room: 1312)		
	Session 6 (Room:1320) Chair: Meredith Greer	Session 7 (Room: 1308) Chair: Chidozie Williams Chukwu	Session 8 (Room:1307) Chair: Jasmine Foo
3:30 PM – 4:00 PM	Rongsong Liu <i>An approach to model the bird migration and the transmission dynamics of bird flu among migration birds</i>	Gisèle Goldstein <i>Instantaneous Blowup and Nonexistence of Positive Solutions on R^N and H^N</i>	Christoph Walker <i>The Principle of Linearized Stability in Age-Structured Diffusive Populations</i> (cancelled)
4:00 PM – 4:30 PM	Cameron Browne <i>Eco-evolutionary dynamics of virus and immune response network</i>	John Jurkiewicz <i>Automatic segmentation of multielectrode array</i>	Jenita Jahangir <i>A discrete time stage structured model for host parasitoid interaction with pest control</i>
4:30 PM – 5:00 PM	Boya Yang <i>Mathematical Modeling of Thyroid Disorders and Diabetes</i>	Xi Huo <i>Antimicrobial De-escalation in Intensive Care Units: Implications on Clinical Trial Design Provided by Mathematical Models</i>	Nazia Afrin <i>Bistability in models of Hepatitis B virus dynamics</i>
5:15 PM – 6:15 PM	Plenary Talk: Hayriye Gulbudak (Room: 4309) <i>Multi-Scale Models of Infectious Disease Dynamics and Validating with Data</i> Chair: Wandu Ding		
6:30 PM – 8:00 PM	Banquet dinner at Alumni Hall 202		

Sunday, March 19, 2023		
9:30 AM – 10:30 AM	Plenary Talk: Jasmine Foo (Room: 4309) <i>Computational methods for inferring tumor evolution and heterogeneity</i> Chair: Hayriye Gulbudak	
	Session 9 (Room:1320) Chair: Yixiang Wu	Session 10 (Room: 1308) Chair: Xi Huo
10:45 AM – 11:15 AM	Tung Nguyen <i>Population Persistence in Stream Networks: Growth Rate and Biomass</i>	Rachel Leander <i>Optimal Impulse Control of a Late-Season Model of a West Nile Virus Epidemic</i>
11:15 AM – 11:45 PM	Samantha Brozak <i>Integrating wastewater-based epidemiology and mechanistic models: Implications for public health and variant emergence</i>	Rachidi Salako <i>Effects of Dispersal Rates in a Two-Stage Reaction-Diffusion System</i>
11:45 AM – 12:15 PM	Gregoire Ranson <i>Forecasting the effect of PREP on HIV propagation with a system of difference-differential equations with delays</i>	Xinyue Zhao <i>Bifurcation Analysis of Critical Values for Wound Closure Outcomes in Wound Healing Experiments</i>