FULL PROGRAM SCHEDULE FOR ICMA 2019

Plenary lectures will be held in Physical Sciences Building F (PSF 166)
Parallel sessions will be held in PSF 101, PSF 123, PSF 166 and PSF 173

By default, the chair of each session is the third speaker of that session
Registration is open 7:30 AM to 3 PM on October 12-13, 2019 in PSF 186

SATURDAY MORNING (October 12)

8:00 AM -8:15 AM: **Welcoming Remarks** (PSF 166)
8.15 AM- 8:45 AM: **Group Photograph**
8:45 AM-9:45 AM: **Plenary Talk** (PSF 166) –Stochastically induced extinction, coexistence, and alternative stable states
Sebastian Schreiber, University of California, Davis

10:00 AM -12:00 PM: Parallel Sessions

Session 01 (PSF 101)

10:00 -10:30 AM: Environmental variability in SDE population models
Edward Allen, Texas Tech University
10:30 -11:00 AM: The role of the avian nesting curve in structuring enzootic *West Nile virus* transmission
Suzanne Robertson, Virginia Commonwealth University, Richmond
11:00 -11:30 AM: Probability of a zoonotic spillover in a fluctuating environment
Linda Allen, Texas Tech University
11:30 AM-12:00PM: Analysis of a spatially inhomogeneous stochastic partial differential equation epidemic model
Nhu Nguyen, Wayne State University

Session 02 (PSF 123)

10:00 -10:30AM: Machine learning for automatic segmentation of multielectrode array recordings for electrophysiological analysis
Peter Hinow, University of Wisconsin, Milwaukee
10:30 -11:00 AM: Using a suite of quantitative systems pharmacology models to support clinical development of a novel therapy in autoimmune diseases
Craig Thalhauser, Bristol-Myers Squibb
11:00 -11:30 AM: Joining forces: combining machine learning and mechanistic models to predict tumor cell density
Susan Massey, Mayo Clinic, Phoenix
11:30 AM -12:00 PM: Exploration of global sensitivity analysis methods for physiologically-based pharmacokinetic (PBPK) models
Megan Sawyer, Southern New Hampshire University

Session 03 (PSF 166)

10:00 -10:30 AM: How should multiple agents allocate their contributions to eradicate a common harmful species?
Adam Lampert, Arizona State University
10:30 -11:00 AM: PDE models for multilevel selection: The ghost of lower-level selection and transitions in biological complexity
Daniel Cooney, Princeton University
11:00 -11:30 AM: The role of Allee effects on the evolution of semelparity and iteroparity

Jim Cushing, University of Arizona
11:30 AM -12:00 PM: How the shape of the fertility-survival curve impacts expected life history strategies
Alex Farrell, University of Arizona

Session 04 (PSF 173)

10:00 -10:30 AM: A honeybee population model with stage structure and seasonality
Jun Chen, Arizona State University
10:30-11:00 AM: To run or not to run? A Markov–chain model for behavioral switch during nest selection in Temnothorax ants
M. Gabriela Navas-Zuloaga, Arizona State University
11:00-11:30 AM: Disease, demography and the evolution of social organization
Oyita Udiani, University of Tennessee
11:30 AM-12:00 PM: Dynamics of task allocation of social insect colonies
Tao Feng, Arizona State University and Nanjing University of Science and Technology

SATURDAY AFTERNOON (October 12)

1:30 PM -3:00 PM: Parallel Sessions

Session 05 (PSF 101)

1:30 -2:00 PM: A mathematical examination of wolf reintroduction in Yellowstone National Park: Capturing the mechanisms of predator dependent birth rates of prey
Jack Pringle, Arizona State University
2:00 -2:30 PM: Deriving a spatially extended model of savanna dynamics
Denis Patterson, Brandeis University
2:30-3:00 PM: Rabies spreading speeds, territorial and diffusing rabid foxes, and arbitrarily distributed latency
Horst Thieme, Arizona State University

Session 06 (PSF 123)

1:30 -2:00 PM: Demographic variability, environmental variability, and periodic fluctuations in stochastic epidemic models with multiple patches
Kaniz Fatema Nipa, Texas Tech University
2:00 -2:30 PM: Traveling wave solution of a diffusive viral infection model with time delay
Srijana Ghimire, University of Louisiana at Lafayette
2:30 -3:00 PM: Effect of spatial average on the spatial-temporal pattern formation of reaction-diffusion systems
Junping Shi, College of William and Mary, Williamsburg

Session 07 (PSF 166)

1:30 -2:00 PM: Quantifying effects of neutrophil memory on migration patterns using microfluidic platforms and ODE modeling of the mechanistic molecular pathways
Brittany Boribong, Virginia Polytechnic Institute and State University, Blacksburg
2:00 PM -2:30 PM: Weaker is better: how weak transient molecular interactions give rise to robust, dynamic immune protection
Jay Newby, University of Alberta, Edmonton, Alberta, Canada
2:30 -3:00 PM: A Continuous and Discrete Mathematical Models for the Aggregation of β-Amyloid
Saber Elaydi, Trinity University, San Antonio

Session 08 (PSF 173)

1:30 -2:00 PM: Contagion dynamics on adaptive networks: Norovirus as a case study

Deena Schmidt, University of Nevada Reno, Reno
2:00 -2:30 PM: Mathematical modeling of Batrachochytrium salamandrivorans on the Eastern Newt with multiple transmission pathways
Rafiul Islam, Texas Tech University, Lubbock
2:30 -3:00 PM: Dispersal Induced Dichotomy in Population Dynamics
Zhisheng Shuai, University of Central Florida, Orlando

3:15 -4:15 PM: **Plenary Talk** (PSF 166) – Multiscale cell fate through lens of single cells
Qing Nie, University of California, Irvine

SATURDAY AFTERNOON (October 12)

4:30 PM - 6:00 PM: Parallel Sessions
Session 09 (PSF 101)
4:30 -5:00 PM: Dynamics of stoichiometric plant-pollinator-herbivore models
Dilini Fonseka, Texas Tech University, Lubbock
5:00 -5:30 PM: A general 'linear chain trick' for building ODE models with flexible Dwell time assumptions
Paul J. Hurtado, University of Nevada Reno, Reno
5:30 -6:00 PM: Saving lives, limbs and healthcare costs: Quantifying the impact of CHG bathing and effective leadership on the reduction of hospital-acquired infections
Kelly Reagan, Virginia Commonwealth University, Richmond
Session 10 (PSF 123)
4:30 -5:00 PM: Stability of diffusively coupled linear systems with an invariant cone
Patrick De Leenheer, Oregon State University, Corvallis
5:00 -5:30 PM: Spatial spread of Chagas disease
Ahuod Alsheri, University of Bisha, Animas, Saudi Arabia
5:30 -6:00 PM: Juvenile-adult discrete time infectious disease models
Pauline van den Driessche, University of Victoria, B.C., Canada
Session 11 (PSF 166)
4:30 -5:00 PM: Nutrient levels and trade-offs control diversity in a model seasonal ecosystem
Jaime Lopez, Princeton University, Princeton
5:00-5:30 PM: A comparative analysis of host–parasitoid models in which density-dependence precedes parasitism
Kelsey Marcinko, University of Washington, Seattle
5:30 -6:00 PM: Competition between consumers in a mixed discrete-continuous model
Glenn Ledder, University of Nebraska-Lincoln, Lincoln, Nebraska
Session 12 (PSF 173)
4:30 -5:00 PM: Resource mediated interactions and species dynamics in microbial communities
Lihong Zhao, University of Idaho, Moscow
5:00 -5:30 PM: Large and small data blow-up solutions in the Trojan Y chromosome model
Matthew Beauregard, Stephen F. Austin State University, Nacogdoches
5:30 -6:00 PM: Environmental seasonality on predator–prey systems under nutrient and toxicant constraints
Lale Asik, Texas Tech University, Lubbock

6:15 PM -7:15 PM: Poster Session (PSF 186)

Population collapse in Elite-dominated societies: A differential equations model without differential equations
Naghmeh Akhavan
Mathematical Modeling of the Re-emergent ZIKA Outbreak in the Endemic Region
Chathuri Edirisinghe Arachchige
Real-Time Forecasting of Influenza-Like-Illness in the United States with a Simple Model
Hannah Biegel
Biphasic bacteria growth curve driven by stress and evolution
Xingwen Chen
A Plausible Accelerating Function of Intermediate States in Cancer Metastasis
Hanah Goetz
1. Bitterness perception in the population and its association with genetic polymorphism and nutritional status
2. Genetic variability of the Fcgamma receptor in the population and its role in disease dynamics and pathogenesis
Susan A. Holechek
Exploring the Effect of the Nestling Recruitment Curve on Enzootic West Nile Virus Transmission
Emily Horton
A mathematical perspective on public health strategies to control the prescription opioid misuse
Aprillya Lanz
Mathematical modeling of an immune checkpoint inhibitor and its synergy with an immunostimulant
Elpiniki Nikolopoulou
HIV-1 Transcriptional Dynamics in T-cells and Macrophages
Tin Phan
Quantifying drug distribution and response dynamics in experimental glioblastoma
Javier Urcuyo
Topology-Dependent Interference of Circuit Function by Growth Feedback
Rong Zhang

<u>**SUNDAY MORNING (October 13)**</u>

8:45 -9:45 AM: **Plenary Talk** (PSF 166) – Mathematics of evolution: Mutations, selection, and random environments
Natalia Komarova, University of California, Irvine

10:00 AM -12:00 PM: Parallel Sessions

Session 13 (PSF 101)
10:00 -10:30 AM: Traveling wave solutions to Glioblastoma Multiforme growth models.
Ardak Kashkynbayev, Nazarbayev University, Nur-Sultan, Kazakhstan
10:30 -11:00 AM: Multi-type branching process theory with applications to cancer and ecology
Feng Fu, Dartmouth College, Hanover
11:00 -11:30 AM: Dynamics and bifurcations of a model of dendritic cell therapy for melanoma
Evan Milliken, Arizona State University, Tempe
11:30AM-12:00PM: Exploiting androgen deprivation-induced inflammation in prostate cancer treatment
Harsh Jain, Florida State University, Tallahassee

Session 14 (PSF 123)
10:00 -10:30 AM: Spatially heterogeneous producer-grazer model subject to stoichiometric constraints

Md. Masud Rana, Texas Tech University, Lubbock

10:30-11:00 AM: An extension to the toxicant mediated predator-prey model under stoichiometric constraints

Md. Nazmul Hassan, Blinn College, Bryan

11:00 -11:30 AM: Mathematical assessment of the role of mosquito insecticide resistance on malaria dynamics

Jemal Mohammed-Awel, Valdosta State University, Valdosta

11:30 AM-12:00 PM: An environmental model of honey bee colony collapse due to pesticide contamination

Yixiang Wu, Middle Tennessee State University, Murfreesboro

Session 15 (PSF 166)

10:00 -10:30 AM: Long-lasting insecticidal nets and the quest for malaria eradication: A mathematical modeling approach

Enahoro Iboi, Arizona State University

10:30 -11:00 AM: Density-dependent emergence alters the efficacy of *Wolbachia*-based mosquito control programs

Michael A. Robert, University of the Sciences in Philadelphia

11:00 -11:30 AM: Modelling the potential role of engineered symbiotic bacteria in malaria control

Xingfu Zou, University of Western Ontario, London, ON, Canada

11:30 AM -12:00 PM: Mathematical modeling and optimal control for malaria transmission using sterile mosquitoes technique and bed nets

Wandi Ding, Middle Tennessee State University, Murfreesboro

Session 16 (PSF 173)

10:00 -10:30 AM: Simulation of *Leishmania mexicana* infection: a mathematical model of the immune response

Ephraim Agyingi, Rochester Institute of Technology, Rochester

10:30 -11:00 AM: Mathematical modeling and numerical analysis of the dynamics of microbial communities

Hitoshi Koyano, Tokyo Institute of Technology, Tokyo

11:00 -11:30 AM: Infection severity across scales in multi-strain immuno-epidemiological Dengue model structured by host antibody level

Hayriye Gulbudak, University of Louisiana at Lafayette, Lafayette

11:30 AM -12:00 PM: Optimal control for a novel fractional order malaria transmission dynamics mathematical model

Nasser Sweilam, Cairo University, Giza, Egypt

SUNDAY AFTERNOON (October 13)

1:30 PM -3:00 PM: Parallel Sessions

Session 17 (PSF 101)

1:30 -2:00 PM: Modeling population dynamics with some generalized logistic type models

Dongming Wei, Nazarbayev University, Nur-Sultan, Kazakhstan

2:00 -2:30 PM: Review: mathematical modeling of androgen deprivation therapy for prostate cancer

Tin Phan, Arizona State University

2:30 -3:00 PM: Spatio-temporal forecasting using Gaussian processes with application to predict brain cancer invasion

Lifeng Han, Arizona State University

Session 18 (PSF 123)

1:30 -2:00 PM: Interplay between predator traits impacts benefits to biological control from predator biodiversity
Amanda Laubmeier, University of Nebraska–Lincoln, Lincoln
2:00 -2:30 PM: Dynamics of a diffusive vaccination model with therapeutic impact and non-linear incidence in epidemiology
Md. Kamrujjaman, University of Dhaka, Dhaka 1000, Bangladesh
2:30 -3:00 PM: Compensatory foraging in stoichiometric producer-grazer models
Angela Peace, Texas Tech University, Lubbock

Session 19 (PSF 166)

1:30 -2:00 PM: Modeling the risk of HIV infection for drug abusers
Angelica Bloomquist, San Diego State University, San Diego
2:00 -2:30 PM: Examining HIV Progression Mechanisms via Mathematical Approaches
Wenjing Zhang, Texas Tech University, Lubbock
2:30 -3:00 PM: Mathematical assessment of the impact of vaccination on pneumococcal colonization, co-colonization and serotype replacement
Tufail Malik, Merck & Co., Inc., Kenilworth, New Jersey

Session 20 (PSF 173)

1:30 -2:00 PM: Dynamics of a discrete-time pioneer–climax model
Nora Gilbertson, University of Washington, Seattle
2:00 -2:30 PM: Modeling the effects of drugs of abuse on HIV infections with two viral species
Peter Uhl, San Diego State University, San Diego
2:30 -3:00 PM: Modeling the coral reef microbiome and black band disease
Naveen Vaidya, San Diego State University, San Diego

3:15 -4:15 PM: **Plenary Talk** (PSF 166) – Modeling biodegradation and methane biogenesis
Hao Wang, University of Alberta, Edmonton, Canada

SUNDAY AFTERNOON (October 13)

4:30 PM - 6:00 PM: Parallel Sessions
Session 21 (PSF 101)

4:30 -5:00 PM: Dynamic observers for prediction of stage-structured populations
Richard Rebarber, University of Nebraska, Lincoln
5:00 -5:30 PM: Multi-structured population dynamics in cyanobacteria
Sabina Altus, University of Colorado Boulder, Boulder
5:30 -6:00 PM: Modeling CAR T-cell therapy with patient preconditioning
Katherine Owens University of Washington, Seattle

Session 22 (PSF 123)

4:30 -5:00 PM: Dynamic model for life history of scyphozoa
Congbo Xie, Dalian Minzu University, Dalian, Liaoning, China
5:00 -5:30 PM: Dynamics of an intraguild predator-prey system with internal storage in an unstirred chemostat
Feng-Bin Wang, Chang Gung University, Guishan, Taoyuan 333, Taiwan
5:30 -6:00 PM: A stage-structured population model for activity-dependent dendritic spines
Morteza Rouhani, Arizona State University

<div align="center">**Session 23 (PSF 166)**</div>

4:30 -5:00 PM: Towards a multi-scale modeling and analysis of translation dynamics: From molecular to cellular level
Khanh Dao Duc, University of British Columbia, Vancouver
5:00 -5:30 PM: Improved foraging by switching between diffusion and advection: Benefits from movement that depends on spatial context
William Fagan, University of Maryland, College Park
5:30 -6:00 PM: Modeling land-use change, economic development, and malaria dynamics in frontier regions
Andres Baeza-Castro, Arizona State University

<div align="center">**Session 24 (PSF 173)**</div>

4:30 -5:00 PM: Underlying strain space structure and *influenza A* eco-evolutionary dynamics
Chadi Saad-Roy, Princeton University, Princeton
5:00 -5:30 PM: Regional level influenza prediction model with mechanistic PDE approach and sampling twitter data
Yufang Wang, Tianjin University of Finance and Economics, Tianjin, China
5:30 -6:00 PM: Combining network theory and partial differential equation to improve influenza prediction **Haiyan Wang**, Arizona State University, Phoenix

<div align="center">**MONDAY MORNING (October 14)**</div>

8:45 -9:45 AM: **Featured Talk** (PSF 166) – Edge behavior determines large scale population dynamics in strongly heterogeneous landscapes
Brian Yurk and Christina Cobbold, Hope College, Holland, MI and University of Glasgow, Glasgow, UK

<div align="center">**10:00 AM -12:00 PM: Parallel Sessions**</div>

<div align="center">**Session 25 (PSF 101)**</div>

10:00 -10:30 AM: Stoichiometric modeling and multi-scale dynamics of cyanobacteria
Christopher Heggerud, University of Alberta, Edmonton, Canada
10:30 -11:00 AM: Somitogenesis by a synthetic gene circuit
Xiao Wang, Arizona State University
11:00 -11:30 AM: Reaction-diffusion based pattern formation modeling and its basic dynamical behavior
Changhan He, Arizona State University
11:30 AM -12:00 PM: Control of circuit-host interactions toward engineering robust gene circuits
Xiaojun Tian, Arizona State University

<div align="center">**Session 26 (PSF 123)**</div>

10:00 -10:30 AM: Accelerating invasions and the asymptotics of fat-tailed dispersal
Benjamin Liu, University of Washington, Seattle
10:30 -11:00 AM: Network modeling the impact of community-based male-screening on the Chlamydia trachomatis prevalence in women
Zhuolin Qu, Tulane University, New Orleans
11:00 -11:30 AM: Backward bifurcations in discrete dynamical systems and applications to nonstandard discretizations of epidemiological models
Jean Lubuma, University of Pretoria, South Africa
11:30 AM -12:00 PM: Using satellite imagery to predict persistence and distribution of populations
Daniel Collister, University of California, Riverside

<div align="center">**Session 27 (PSF 166)**</div>

10:00 -10:30 AM: Persistence and extinction of stochastic Kolmogorov systems
Hai-Dang Nguyen, University of Alabama, Tuscaloosa
10:30 -11:00 AM: Investigating differential impacts of treatment non-adherence on the dynamics of vector-borne diseases: Case study of elimination of Visceral Leishmaniasis from Bihar, India by 2020
Mughda Thakur, Arizona State University
11:00 -11:30 AM: Dynamics of task allocation of social insect colonies
Yun Kang, Arizona State University, Mesa
11:30 AM -12:00 PM: Malaria transmission, land use, and poverty traps in a warming world
Steffen Eikenberry, Arizona State University

Session 28 (PSF 173)

10:00 -10:30 AM: Network modeling of plant disease epidemics in space and time: The case of Cucurbit Downy Mildew (CDM) in the eastern United States
Awino Maureiq Edith Ojwang, North Carolina State University, Raleigh
10:30 -11:00 AM: Targeting heterogeneity: Yard-scale treatments to reduce citywide *Aedes* populations
Brandon Hollingsworth, North Carolina State University, Raleigh
11:00 -11:30 AM: Uncertainty quantification for prostate cancer models
Penny Wu, Arizona State University
11:30 AM -12:00 PM: Sensitivity analysis and impact of an imperfect vaccine of two strains HBV vaccination model
Chandra Nath Podder, Department of Mathematics, University of Dhaka, Bangladesh