

Thursday, July 25

9:00–10:00: PLENARY

Nick Monk, “Mathematical Modelling in Biology: Integration and Differentiation”
Z-110, Pavillon Claire-McNicoll (streaming in Z-220 and Z-210)

10:00–10:30: BREAK

10:30–12:30: MINISYMPOSIA

Z-110: Mathematical Modelling of Neuronal Networks

- 10:30–11:00: Frances Skinner, “Balances and features underlying intrinsic theta generation in the hippocampus”
- 11:00–11:30: Wilten Nicola, “Using Oscillations to Encode Information in the Hippocampus”
- 11:30–12:00: Shusen Pu, “Stochastic Shielding Analysis of Conductance-Based Neuron Models Under Current Clamp”
- 12:00–12:30: Youngmin Park, “Scalar Reduction of a Neural Field Model with Spike Frequency Adaptation”

Z-200: Stochastic models for biochemical reaction networks

- 10:30–11:00: David Anderson, “Stochastic Chemical Reaction Networks for Robustly Approximating Arbitrary Probability Distributions”
- 11:00–11:30: Tung Nguyen, “Prevalence of deficiency zero reaction networks”
- 11:30–12:00: Andrea Agazzi, “Large Deviations for Strongly Endotactic Chemical Reaction Networks”
- 12:00–12:30: Jinsu Kim, “Stability and mixing times for stochastically modeled weakly reversible reaction networks with a single linkage class”

Z-205: Building bridges for mathematical biology education

- 10:30–11:00: John Jungck, “How 4D Printing Helps Students Explore Self-Assembly, Geometry, Topology and Combinatorics”

- 11:00–11:30: Holly Gaff, “Hands-on teaching: Introducing math biology to life sciences graduate students”
- 11:30–12:00: Meredith Greer, “Math Fundamentals: One Model at a Time”
- 12:00–12:30: Carrie Diaz Eaton, “RULE-OF-FIVE”

Z-220: Mathematical oncology from bench to bedside

- 10:30–11:00: Eunjung Kim, “Mathematical Model Driven Personalized Adaptive Therapy”
- 11:00–11:30: Renee Brady, “Optimizing docetaxel scheduling to delay progression in metastatic prostate cancer patients receiving hormone therapy”
- 11:30–12:00: Thomas Yankeelov, “Patient-specific predictions via multi-scale imaging and multi-scale modeling”
- 12:00–12:30: Kristin Swanson, “Using MRI to Predict Drug Distribution in Glioblastoma Patients”

Z-210: Global Dynamics : Coexistence and Extinction in Mathematical Models from Ecology and Epidemiology

- 10:30–11:00: Jim Cushing, “Evolution of Life History Strategies: Semelparity versus Iteroparous”
- 11:00–11:30: Amy Veprauskas, “Evolutionary responses to a disturbance in a predator-prey system”
- 11:30–12:00: Alex Farrell, “Prey-Predator-Parasite: An Ecosystem Model With Fragile Persistence”
- 12:00–12:30: Mondal Zahid, “Decoys and dilution: the impact of incompetent hosts on prevalence of Chagas disease”

Z-215: Vector-borne diseases: improving our understanding of underlying mechanisms and implications for disease control

- 10:30–11:00: Lauren Childs, “Modeling novel strategies to block malaria transmission”
- 11:00–11:30: Guido Camargo España, “Agent-based model to assess public health impact of pre-vaccination screening strategy against dengue with the Dengvaxia vaccine”
- 11:30–12:00: Jeffery Demers, “Implicit versus explicit control strategies in models

for vector-borne disease epidemiology”

- 12:00–12:30: Omar Saucedo, “Comparing the Eulerian and Lagrangian Spatial Models for Vector-Borne Disease Dynamics”

Z-209: Mathematical modelling of bees

- 10:30–11:00: Hermann Eberl, “The Combination of Seasonal Variations and Direct Disease Transmission in A Mathematical Model of Nosemosis Can Lead to Chaos in the Hive”
- 11:00–11:30: Yun Kang, “Population Dynamics of Honeybees: Effects of Parasites and Nutrition”
- 11:30–12:00: Nourridine Siewe, “Should Wildflowers be Planted In or Around Blueberry Farms?”
- 12:00–12:30: Ezio Venturino, “FIELD-DATA-BASED VIRAL EPIDEMIC MODELS FOR VARROA-AFFECTED BEE COLONIES”

Z-245: Modelling intracellular transport

- 10:30–11:00: Lyubov Chumakova, “Microtubule cytoskeleton self-organisation is robust in *Drosophila* epithelium”
- 11:00–11:30: Aleksandra Plochocka, “Microtubule cytoskeleton self-organisation in cells with anisotropic cytoplasm”
- 11:30–12:00: Eric Cytrynbaum, “Control of plant cell growth through cortical microtubule mechanics”
- 12:00–12:30: Thomas Fai, “Fluid dynamics of vesicular transport in dendritic spines”

Z-255: Modeling, dynamics and control of African Swine Fever

- 10:30–11:00: Xinmiao Rong, “Modeling the outbreak and control of African swine fever virus in a large scale pig farm”
- 11:00–11:30: Liping Wang, “Modeling and assessing the effect of the movement of boars on the spread of African swine fever in China”
- 11:30–12:00: Pei Yuan, “Risk factors assessment for the spread of African Swine Fever in China using an extended Cox hazard model”
- 12:00–12:30: Juan Li, “Dynamical modeling of the transmission of African swine fever in a few earlier endemic sites in China”

Z-260: Structured population models for disease transmission dynamics

- 10:30–11:00: Yijun Lou, “Population growth with continuous and non-continuous development durations”
- 11:00–11:30: Justin Munganga, “Applying the chemical-reaction definition of mass action to infectious disease modelling”
- 11:30–12:00: Felicia Magpantay, “Vaccine impact in homogeneous and age-structured models”
- 12:00–12:30: Jorge Velasco Hernandez, “The role of animal grazing in the spread of Chagas disease”

Z-305: Disease and control

- 10:30–11:00: Folashade Augusto, “Impact of Regional Movement on Methicillin-resistant Staphylococcus Aureus among Injection Drug Users”
- 11:00–11:30: Mudassar Imran, “The Optimal control of HPV Infection and Cervical Cancer with HPV vaccine”
- 11:30–12:00: Abba Gumel, “Long-lasting insecticidal nets and the quest for malaria eradication: A modeling approach”
- 12:00–12:30: Adnan Khan, “From LQ formalism to Mechanistic Models based Optimal Dosing in Radiotherapy”

12:30–13:30: LUNCH

Pavillon Jean-Coutu

Panel Discussion (Z-110): Data Science Education for Biology

13:30–14:30: PLENARY

Naoki Masuda, “Network dynamics: Epidemic processes and energy landscape analysis”

Z-110, Pavillon Claire-McNicoll (streaming in Z-220 and Z-210)

14:30–15:30: CONTRIBUTED TALKS

Z-200

- 14:30–14:50: Kseniya Fuhrman, “Progression of Numerical Techniques for Model Construction and Analysis”
- 14:50–15:10: Anthony Sun, “On the mathematical form of an incentive in a socioecological model”
- 15:10–15:30: John Zobitz, “Development of computational tools in R for an undergraduate mathematical biology and modeling course”

Z-205

- 14:30–14:50: Faina Berezovsky, “Modeling of “replicator - genetic parasite” dynamics and coexistence”
- 14:50–15:10: Vasiliki Bitsouni, “Modelling calcium signalling in cancer growth”
- 15:10–15:30: Min Wu, “Stress generation, relaxation and size control in restricted tumor growth”

Z-209

- 14:30–14:50: Brittany Bannish, “Effects of clot contraction and fiber distribution on blood clot degradation”
- 14:50–15:10: Joe E Moran, “Understanding rabies persistence in low density fox populations”
- 15:10–15:30: Carly Rozins, “Can phage therapy replace antibiotics?”

Z-210

- 14:30–14:50: Mary Myerscough, “A Structured Population Model for Lipid Accumulation in Macrophages”
- 14:50–15:10: Lubna Pinky, “Quantifying Kinetic Differences in Two Recombinant Parainfluenza Viruses”
- 15:10–15:30: Jessica Stockdale, “Modelling and genomics to identify dangerous *Streptococcus pneumoniae* strains”

Z-215

- 14:30–14:50: Shawn Means, “Weaving a Tangled Web: Neurons and Networks”
- 14:50–15:10: Sean Parsons, “Coupled oscillators in the gut”
- 15:10–15:30: Paul Roberts, “Investigating the functional connectivity of the ze-

brafish retina”

Z-220

- 14:30–14:50: Fazal Abbas, “A New Approach to Substrate Flux Approximation for Monod Boundary Value Problem Arises in the Study of Biofilms”
- 14:50–15:10: Erida Gjini, “How mathematical modeling of *Trypanosoma brucei* population dynamics in mice can test hypotheses for parasites growing in adipose tissue versus blood”
- 15:10–15:30: Thi Mui Pham, “Tracking *P. aeruginosa* transmission routes in intensive care units using mathematical models”

Z-245

- 14:30–14:50: Matthew Adamson, “Predicting resilience proles of the run-up to regime shifts in nearly-1D systems”
- 14:50–15:10: Mathieu Legros, “Gene drive strategies of pest control and resistance management in agriculture”
- 15:10–15:30: Max Souza, “From fixation probabilities to d -player games: an inverse problem in evolutionary dynamics”

Z-255

- 14:30–14:50: Aurelio de los Reyes, “STRATEGIES IN CONTROLLING GLIOBLASTOMA INVASION”
- 14:50–15:10: Vincent MacKay, “Double-wave Reentry in Excitable Media”
- 15:10–15:30: Ana Osojnik, “Systematic analysis of a bifurcating model of tumour-immune interactions”

Z-305: Mentoring Room

15:30–16:00: BREAK

16:00–18:00: MINISYMPOSIA

Z-110: Mathematical Modelling of Neuronal Networks

- 16:00–16:30: Rodica Curtu, “Dynamic Features of Bistable Auditory Perception - A Modeling Perspective”
- 16:30–17:00: Yangyang Wang, “Complex bursting patterns in an embryonic respiratory neuron model”
- 17:00–17:30: Anca Radulescu, “A network model of the striatum captures hyperactivity patterns in obsessive compulsive disorder”
- 17:30–18:00: Janet Best, “Serotonin circuitry in the brain”

Z-200: Advances in cancer treatment scheduling and optimization

- 16:00–16:30: Jana Gevertz, “Robust Versus Personalized Optimization of Cancer Immunotherapy”
- 16:30–17:00: Patrick Ellsworth, “Informing Cancer Treatment Decisions Using Spatial Evolutionary Game Theory”
- 17:00–17:30: Ibrahim Chamseddine, “Optimizing Ligand Properties in Pancreatic Cancer Targeted Therapy”
- 17:30–18:00: Michael Kokkolaras, “Numerical Optimization in Cancer Nanotherapy”

Z-205: Building bridges for mathematical biology education

- 16:00–16:30: Paul Macklin, “Cloud-hosted mathematical models: links between education, research, and outreach”
- 16:30–17:00: Reggie McGee, “Teaching reflections after one year on the tenure-track”
- 17:00–17:30: Hwayeon Ryu, “Building an academic learning community between biology and statistics”
- 17:30–18:00: Eberhard Voit, “Options for Integrating Computational Modeling into Biological Curricula”

Z-209: Mathematical modelling of protein misfolding disease

- 16:00–16:30: Justin Torok, “Combined model of network spread and protein aggregation recapitulates the spatiotemporal progression in Alzheimers disease”
- 16:30–17:00: Paul Lemarre, “Application of impulsive differential equations to

the case of yeast prion propagation, re-definition of the biological concept of propagon”

- 17:00–17:30: Human Rezaei, “Constitutional Dynamic of Prion Assemblies”
- 17:30–18:00: Mikahl Banwarth-Kuhn, “Study of the effect of individual cell behaviors on prion protein aggregation and propagation in yeast”

Z-210: Stochastic models for biochemical reaction networks

- 16:00–16:30: Badal Joshi, “A stochastic model of autocatalytic reaction networks”
- 16:30–17:00: Chaojie Yuan, “Time-dependent product-form Poisson distributions for reaction networks with non-linear dynamics”
- 17:00–17:30: Andres Ortiz-Munoz, “Combinatorics of Reaction Networks with Complex Balance”
- 17:30–18:00: German Enciso, “Absolutely Robust Control Modules in Chemical Reaction Networks”

Z-215: Validation of mathematical models in immunology and cancer

- 16:00–16:30: Maria D’Orsogna, “Effects of TCR-specific thymic output and proliferation on naive T cell clone abundance distributions”
- 16:30–17:00: Angela Reynolds, “Analysis of an innate immune response model and the role of inflammation in atherosclerosis”
- 17:00–17:30: David Swigon, “Inverse problem for dynamical systems arising from mathematical immunology”
- 17:30–18:00: Atanaska Dobрева, “Inflammatory-thermal-pain-cardiovascular interactions during a pathogen challenge”

Z-220: Modelling gene transcription

- 16:00–16:30: Jacqueline Dresch, “Investigating the sequence composition of core promoter elements in *Drosophila* and human using a computational analysis”
- 16:30–17:00: Jae Kyoung Kim, “Predicting cytotoxicity of natural killer cell”
- 17:00–17:30: Cicely Macnamara, “Oscillations in Gene Regulatory Networks: The Importance of Spatial Aspects”
- 17:30–18:00: David Rand, “TimeTeller: a New Tool for Precision Circadian

Medicine and Cancer Prognosis”

Z-245: Multiscale modeling of cytoskeleton-mediated cellular transport and aggregation

- 16:00–16:30: Jay Newby, “Limited processivity of single motors improves overall transport flux of self-assembled motor-cargo complexes”
- 16:30–17:00: Veronica Ciocanel, “A renewal reward approach for studying models of intracellular transport”
- 17:00–17:30: Diana White, “Modelling microtubule dynamic instability: microtubule growth, shortening and pausing”
- 17:30–18:00: Abhishek Choudhary, “STOCHASTIC MODELING OF INTRACELLULAR TRANSPORT IN NEURONS”

Z-255: Modeling Cancer within the patient: a host-level focus

- 16:00–16:30: Suzan F Sardroodi, “A Mathematical Model for Muscle Wasting in Cancer Cachexia”
- 16:30–17:00: Chiara Nicolo, “Machine learning combined to mechanistic modeling of differential effects of neo-adjuvant Sunitinib on primary tumor and metastatic growth”
- 17:00–17:30: Adrienne Jenner, “Viro-immunotherapy for Glioblastomas: In Silico Optimisation of Therapy Delivery”
- 17:30–18:00: Kathleen Wilkie, “Using a Mathematical Model to Explore the Power of Systemic Inflammation in Tumour Growth”

Z-260: Optimization and optimal control in mathematical biology

- 16:00–16:30: Margaret Grogan, “A model for the treatment and competition of malaria parasite strains”
- 16:30–17:00: Anthony J Kearsley, “Control of inward solidification in Cryobiology”
- 17:00–17:30: Adarsh Kumbhari, “Are heart muscles affected by mitochondrial dynamics?”
- 17:30–18:00: Luis Melara, “Optimal Control of Mixed Treatments for Retinitis Pigmentosa”

Z-305: Analysis of doomed invasions in oncology, epidemiology and ecology

- 16:00–16:30: Fred Adler, “Extinction is (almost) inevitable: Why cancer is rare”
- 16:30–17:00: Evan Milliken, “Can random fluctuations reconcile competitive exclusion with biodiversity?”
- 17:00–17:30: Tom Chou, “Immigration-induced transition in a regulated multi-species birth-death-immigration process”
- 17:30–18:00: Peter Pang, “A cancer invasion model involving chemotaxis and haptotaxis”