**Nonlinear Dynamics in Life Sciences Summer School, Montreal 2018**
**with Applications to Neuroscience and Psychology**
**PRELIMINARY Schedule of Topics and Speakers**

| Dates | Foundation Topics | Applications in Neuroscience and Psychology | Mentors | Computer Lab |
|---|---|---|---|---|
| Monday June 18 | Finite difference equations, phase resetting and phase locking Poincaré maps; intro to ordinary differential equations | Perception, action, sensorimotor integration | **Theory:** Leon Glass, Gil Bub **Applications:** Julie Carrier | Leon Glass |
| Tuesday June 19 | Coupled nonlinear oscillators, phase locking, phase transitions, population persistence and spread | Synchronization and group dynamics | **Theory:** Frédéric Guichard, Frithjof Lutscher **Applications:** Caroline Palmer | Frédéric Guichard, Frithjof Lutscher |
| Wed, June 20 | Bifurcation methods; electrophysiological systems: Hodgkin-Huxley, FitzHugh-Nagumo models | Sensory transduction, neural plasticity, information processing | **Theory:** Michael Guevara, Anmar Khadra **Applications:** Derek Bowie | Michael Guevara, Anmar Khadra |
| Thursday June 21 | Model identifiability, principal component analysis | Network analysis, clustering methods | **Theory:** Jacques Bélair, Erik Cook **Applications:** Arjun Krishnaswamy | Erik Cook |
| Friday June 22 | Deterministic and stochastic dynamics, reaction kinetics | Gene and metabolic networks | **Theory:** Michael Mackey, Paul Francois **Applications:** Paul Francois | Paul Francois |
| Monday June 25 | Linear and nonlinear systems identification, time series, recurrence quantification analysis | Perceptual development, sensori-motor integration | **Theory:** Erik Cook **Applications:** Paula Silva | Erik Cook, Paula Silva |
| Tuesday June 26 | Brain dynamics underlying cognitive functions | Memory networks, relational binding, developmental brain changes | **Theory:** Andre Longtin **Applications:** Jennifer Ryan | Andre Longtin |
| Wed June 27 | Neural networks | Brain rhythms and synchrony, auditory / visual neuroscience, psychophysics | **Theory:** Andre Longtin **Applications:** Molly Henry | Andre Longtin |
| Thurs/Fri June 28-29 | Special projects | Trainee presentations | Trainee Presentations | Trainees |