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Canada. *Patterns in collective motion and space use of animal populations: a mechanistic
approach.*

Patterns associated with animal movement are observed at various scales in nature. One can think of the formation of fish schools or flocks of birds which show an amazing level of self-organization and coherence. At the macroscopic scale, the distribution of animal populations also shows patterning driven by behavior, but also by exogenous factors: landscape, land cover, human disturbances, etc. In this talk, I will present recent advances in the mathematical modelling of animal movements and the emerging patterns observed. By a mechanistic approach, one means approximating probability based local rules of movement of a reference individual via a limiting process to a deterministic partial differential equation describing macroscopic features of movement; i.e. patterns. Examples are drawn from models of single species collective motion, models of divided populations, patterns of space use for large mammals (e.g. coyotes, caribou). (Received September 05, 2014)