

Complexity Science Group Seminar

**Thursday, 9 May 2013, 11:00 AM
Science B 105**

Pattern formation - a missing link in the study of ecosystem response to climate change

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Self-organization processes leading to pattern formation phenomena are ubiquitous in nature. Cloud streets, sand ripples, stone patterns and animal-coat patterns are a few examples. Intensive theoretical and experimental research efforts during the past few decades have resulted in a mathematical theory of pattern formation whose predictions are well confirmed by controlled laboratory experiments. There is increasing observational evidence that pattern formation also plays an important role in shaping water-limited landscapes. Depending on the rainfall regime, self-organized vegetation patchiness in the form of nearly periodic spot, stripe and gap patterns has been reported. Supporting these observations are studies of spatially explicit vegetation models that have reproduced many of the observed patterns. In this talk I will review the state of art in studies of vegetation pattern formation, and delineate manners by which pattern formation processes can affect ecosystem response to environmental changes. The latter include gradual and incipient regime shifts induced by droughts and disturbances, the possible emergence of unexpected resonant patterns in water-harvesting practices of vegetation restoration, and mechanisms of species coexistence in stressed environments.



Everyone is welcome!

