

THE UNIVERSITY



OF HONG KONG

*Institute of Mathematical Research*

*Department of Mathematics*

# WORKING SEMINAR

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December 2, 2014 (Tuesday), 2:00 - 3:00pm

Rm 210, Run Run Shaw Building, HKU

# Universals and anecdotes in Biology

## Abstract

Biology is perhaps the best place where to study the physical nature of information. For this reason it should be placed, in the classification of sciences, next to mathematics. Yet the huge diversity of living organisms makes that exploration of this proximity may look hopeless. We shall show that the main problem stems from the fact that, in order to be deployed in the real world, information has to be tied with matter, space, time and energy: life has to be "materialized". We will show that this has considerable consequences, as stuff made of matter, starting with atoms, then molecules and more complex arrangements of atoms display highly specific idiosyncrasies. This creates conflicts that must be solved by a variety of ad hoc solutions, progressively recruited by natural selection. This results in organisms that, despite underlying universal laws of management of information, look extremely varied. We shall illustrate this situation with concrete examples, noting that the future of biology will lie in approaches that will allow us to extract universals under multiple covers of anecdotes.

*All are welcome*