

CU Physics Department Colloquium

Monday, March 5, 2012 4:10 PM 428 Pupin Hall



Stephane Munier, CNRS, École Polytechnique, will present his colloquium on:

**“Branching random walks with selection:
from Darwinian evolution to particle
physics”**

Branching random walks appear in various fields of science, including biology, physics and computer science.

For biologists, they may model the time evolution of a population. An interesting question to address is then, for example, to estimate the number of generations one has to go back in the past to find the most recent common ancestor of a given set of individuals.

More surprisingly maybe, branching random walks were recognized to appear in the context of particle physics, in the way how quantum fluctuations build up in the wave function of a fast hadron. One of the problems to solve in that context is to compute the density of these fluctuations at a given energy, since the latter is directly related to cross sections measured in high-energy experiments.

The main focus of this talk will be to present a qualitative understanding of the properties of the branching random walks which are subject to some Darwinian selection mechanism, and to show how quantitative answers to the above questions can be derived in a simple way.