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### Talk 2:

## **The interplay between stochasticity and delay II**

In the second talk, I will focus in the case in which the creation reaction that is initiated stochastically takes a finite time to be completed. I will explain the use of a time-reversal invariance assumption that allows one to obtain an approximate effective Markovian master equation for which usual techniques, such as van Kampen expansion, can be applied. I will apply the methodology to a protein-dynamics model that explicitly includes transcription and translation delays. I will show that the equations for the mean values deviate from the ones obtained from intuitive arguments, and that oscillatory behavior is not possible in this system. I will discuss the calculation of correlation functions in stochastic systems with delay, stressing the differences with Markovian processes. Finally, I will explain the extension of residence time algorithms, such as Gillespie's, to perform numerical simulations of stochastic processes including delay.