

THE CRM APPLIED MATHEMATICAL PHYSICS (CAMP) SEMINARS



CENTRE DE RECERCA MATEMÀTICA

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Genetic and electric circuits follow the same rules.

Abstract:

Synthetic biology seeks to envision living cells as a matter of engineering. However, increasing evidence suggests that the genetic load imposed by the incorporation of synthetic devices in a living organism introduces a sort of unpredictability in the design process. As a result, individual part characterization is not enough to predict the behavior of designed circuits and thus, a costly trial-error process is eventually required. A new theoretical framework is necessary for the predictive treatment of the genetic load and their relationship with the observed reduction of the expression of a given synthetic gene when an extra genetic load is introduced in the circuit. The theory also explains that such dependence qualitatively differs when the extra load is added either by transcriptional or translational modifications. Interestingly, considering the limitation of the cellular resources as a limiting factor for gene expression, the mathematical formulation converges to an expression analogous to the Ohm's law for electric circuits.

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Place: Room C1/028

Time: 12:00

