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Talk 1:

Error rates in biological copying

Biological systems are able to copy information at a finite temperature with outstanding fidelity. In biochemical reactions, discrimination of copies with respect to a template can occur in forward rates, backward rates, or both. I will show how, in simple copying schemes, these two discrimination modes lead to opposite tradeoffs between error, dissipation and reaction velocity. I will also discuss examples of how different schemes can be combined in multi-step reactions, and compare the results with experimental studies of and protein synthesis.

Refs.: P. Sartori and S. Pigolotti, Phys. Rev. Lett. 110, 188101, 2013 / P. Sartori and S. Pigolotti, in preparation.