

My visit included the collaboration with

(1) Prof JMR Parrondo

We discussed about the thermodynamics of computation and worked on a paper that will be finished early december during the visit of the third person involved, Prof. R. Kawai.

We derive a simple general formula for the average cost of computation. We show that the fluctuation theorem remains valid for the fluctuating cost of computation, and illustrate this with explicit calculations and simulations of various scenarios using a Brownian computer, namely the original Szilard machine, a more complicated 3-way splitting device, and a model for the AND gate.

(2) Prof. D. Alonso.

We gave talk on the many faces of the second law. We discussed the relation of these thermodynamics considerations with the issues of dynamical chaos. We also discussed recent work on quantum entanglement as a possible source of entropy production. We hope to set-up a collaboration on this theme. Finally we discussed the possibility for organizing an ESF sponsored meeting combining the various themes of quantum entanglement, microscopic chaos and thermodynamics.