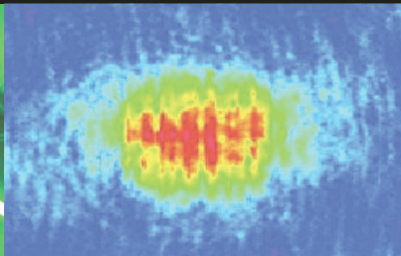# Joint UoC/FORTH AMO Seminar

Symmetries and monotones in Markovian quantum dynamics

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It is hard to overemphasize the role of symmetries in theoretical physics. Noether's famous theorem establishes the correspondence between continuous symmetries and conserved quantities. However, when it comes to open quantum systems described by a Markovian master equation, conserved quantities have a much more limited role. For instance, in the thermodynamically realistic case of dynamics admitting a unique steady state, there are no non-trivial conserved quantities. What is more, conserved quantities do not always stem from symmetries.

The above remarks seem to suggest that the role of symmetries in open quantum systems is rather limited. However, it is the aim of the present talk to demonstrate otherwise by considering a less strict notion than that of a conserved quantity, namely that of a monotone, i.e., a quantity that is non-increasing under the time evolution. We will systematically treat monotones in Markovian quantum dynamics by the use of quantum information-geometry, providing a generalization of Noether's theorem for this class of quantum dynamics.