



NITheP Webinar Thursday, 1 April 2020, 14h00

Dr Paola Andrea Concha Obando | Brazilian Center of Research in Physics (CBPF)

“Macro-to-micro quantum mapping and the emergence of nonlinearity”



As a universal theory of physics, quantum mechanics must assign states to every level of description of a system, and also describe the interconnections among them. Assuming that we only have coarse-grained access to a physical system, here we show how to assign to it a microscopic description that abides by all macroscopic constraints. In order to do that, we employ general coarse-graining maps, allowing our approach to be used even when the split between system and environment is not obvious. As a by-product, we show how effective

nonlinear dynamics can emerge from the linear quantum evolution, and we readily apply it to a state discrimination task.

BIOGRAPHY

Dr Paola Andrea Concha Obando obtained her PhD in Physics from the Universidade Federal Fluminense, Brazil.

Her thesis, “[Quantum correlations and quantum coherence in open systems](#)” has afforded her the opportunity to study different aspects of the quantum information theory, expanding her knowledge in quantum correlations as well as in open quantum systems. She has worked in these areas since her MSc studies at Instituto Balseiro in Argentina.

Paola is currently a Postdoc at the Brazilian Center of Research in Physics (CBPF) where she is investigating the connections between the macro and micro description by coarse-graining maps.

Her main research interests are focused on open quantum systems, (Markovian and non-Markovian regimes), quantum information, quantum correlations, quantum channels, and coarse-graining maps. A list of substantial results from her research, which include some experimental collaborations, can be found [here](#).

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