Guia docent
32074 - SMQO - Mètodes Estadístics en Òptica Quàntica

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Unitat responsable: Escola Tècnica Superior d'Enginyeria de Telecomunicació de Barcelona
Unitat que imparteix: 1022 - UAB - Universitat Autònoma de Barcelona.

Titulació: **Curs:** 2015 **Crèdits ECTS:** 2.5
Idiomes: Anglès

PROFESSORAT

Professorat responsable: John Calsamiglia

Altres: Giovanna Morigi

METODOLOGIES DOCENTS

Presencial Teaching + activities

OBJECTIUS D'APRENENTATGE DE L'ASSIGNATURA

The aim of this course is to provide students with theoretical skills and insight into the dynamics of quantum systems in the presence of classical and quantum noise, i.e. quantum open systems. The theory of quantum open systems is not only a requisite to describe realistic (non-isolated) quantum systems, but it also provides interesting ways of manipulating quantum information through the action of quantum measurements and possibly feedback. The course will introduce basic elements of quantum noise and will also cover advanced topics and tools that will expose students to current research problems. Basic knowledge of quantum mechanics is required.

CONTINGUTS

(CAT) The density matrix

(CAT) Derivation of the Master Equation

(CAT) Quantum Trajectories

(CAT) Quantum coherence in noisy environments

(CAT) -

SISTEMA DE QUALIFICACIÓ

The students will hand in exercises weekly and present them at the blackboard by turns.
A final examination will take place which form will be fixed depending on the number of attendees

NORMES PER A LA REALITZACIÓ DE LES PROVES.

The usual in University teaching

BIBLIOGRAFIA

Bàsica:

- Carmichael, H.J. An open systems approach to quantum optics: Lectures Presented at the Universite Libre De Bruxelles October 28 to November 4, 1991. Berlin: Springer Verlag, 1993. ISBN 0387566341.
- Gardiner, C.W.; Zoller, P. Quantum noise: a handbook of Markovian and non-Markovian quantum stochastic methods with applications to quantum optics. 3rd ed. Berlin ; Barcelona [etc.]: Springer Verlag, 2004. ISBN 3540223010.

Complementària:

- Buchleitner, A.; Hornberger, K. (eds.). Coherent evolution in noisy environments. New York: Springer, 2002. ISBN 3540443541.
- Mölmer, K. Lectures at the Winter School on Quantum Optics. Trieste, Italy: ICTP (International Centre for Theoretical Physics), 1994.