

**SEMINARIO**  
**Departamentos de Física Teórica I y II**  
**Universidad Complutense de Madrid**

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**TITULO:** *Mixed state geometric phases: an overview*

**LUGAR:** FACULTAD DE CIENCIAS FÍSICAS UCM

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**ABSTRACT:**

The geometric phase in quantum mechanics was first discovered by Michael Berry in 1984 in a cyclic adiabatically evolved quantum systems. Since then generalizations have been made, for example to non-adiabatic as well as non-cyclic evolutions.

Geometric phases have found many applications, such as detecting quantum phase transitions, robust holonomic quantum computation (both adiabatically and non-adiabatically) and recently detecting topological properties in many body systems using geometric phases for mixed states.

In my talk I will discuss the difference between two types of geometric phase for mixed state, one proposed by Uhlmann in 1986 and one proposed by us in 2000.