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**Playing, probing and learning many body physics  
with ultracold gases**

Probing quantum magnetism with ultracold atoms is a first step towards the study of strongly correlated systems. For instance, the controlled generation of double well optical lattices has made possible to isolate and address individually pairs of atoms and hence to manipulate their interaction so that they are analogous to the interactions between atomic spins in magnetic materials. In this colloquium I shall focus on the problem of detection, showing how strongly correlated states of ultracold atoms can be detected in a quantum non-demolition scheme, that is, in the fundamentally least destructive way permitted by quantum mechanics.



**29. Januar 2010, 14:00 Uhr**

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