

# “New Mysteries from the Quantum World”

*Séminaire général du Département de Physique de l'École Polytechnique*

In the world of quantum mechanics, the Heisenberg Uncertainty Principle is a key feature that for many years was thought of as a limitation or disadvantage. Physicists have recently come to realize that quantum uncertainty can in fact be a useful resource to encrypt information securely, create ‘quantum money’ that cannot be counterfeited, ‘teleport’ quantum states from one place to another, and build quantum computers that can solve certain problems exponentially faster than classical computers. This talk will give an elementary introduction to these ideas and briefly describe current experimental attempts to construct the quantum bits that might someday form the building blocks of a practical quantum computer.

*NOTE: This talk is a gentle introduction and does not require prior knowledge of quantum mechanics.*



**Steven Girvin**  
*Department of Physics*  
*Yale University*

**Vend. 5 juin 2009**

**ÉCOLE POLYTECHNIQUE**  
**Amphithéâtre Arago**  
**14 h 00**