

**Yale University  
Department of Physics**

**THE 41st ANNUAL HANAN ROSENTHAL  
MEMORIAL LECTURE**

**Professor Alain Aspect, *Institut d'Optique***

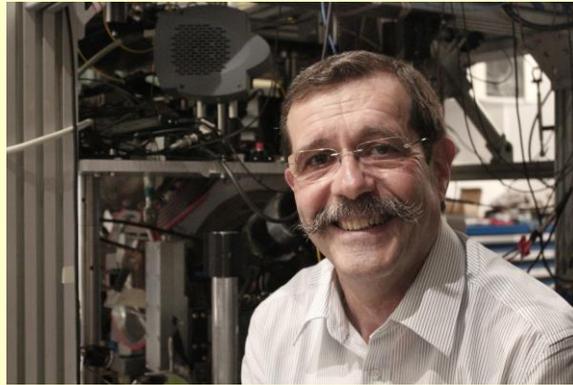


Photo by Jean-François Dars

**“From the Einstein-Bohr debate to quantum information:  
the second quantum revolution”**

In 1935, with co-authors Podolsky and Rosen, Einstein discovered a weird quantum situation, in which particles in a pair are so strongly correlated that Schrödinger called them “entangled”. By analyzing that situation, Einstein concluded that the quantum formalism is incomplete. Niels Bohr immediately opposed that conclusion, and the debate lasted until the death of these two giants of physics.

In 1964, John Bell discovered that it is possible to settle the debate experimentally, by testing the now celebrated “Bell’s inequalities”, and to show directly that the revolutionary concept of entanglement is indeed a reality. A long series of experiments, started in 1972, have produced more and more precise results, in situations closer and closer to the ideal theoretical scheme.

After explaining the debate, and describing some experiments, I will show how this conceptual discussion has prompted the emergence of the new field of quantum information, at the heart of the second quantum revolution.

Alain Aspect, Institut d’Optique Graduate School, Université Paris-Saclay  
<http://www.lcf.institutoptique.fr/Alain-Aspect-homepage>

**Monday, February 5, 2018**

*A reception will be held at 3:00 p.m. in the 3rd Floor Lounge, SPL*

The lecture will be held at 4:00 P.M.  
In the Sloane Physics Laboratory (SPL), Room 59 (overflow in Room 57)  
at 217 Prospect Street, New Haven, CT.  
All interested persons are invited to attend the lecture