

'Shedding new light on Schrödinger's Cat'

Professor Serge Haroche, Nobel Laureate for Physics 2012
DCU Nobel Laureate Lecture Series in association with Magnet Networks

Monday 11th November 2013

Dear Physics teacher

It gives us great pleasure to invite you and your students to join us for the DCU Nobel Laureate Lecture which will take place in The Helix, Dublin City University on Monday 11th November at 11am.

We are honoured, this year, to host Professor Serge Haroche, the Nobel Prize Winner for Physics 2012 who will speak on the topic, 'Shedding new light on Schrödinger's Cat', a look at the strange world of quantum physics.

Full event details are as follows:

"Shedding new light on Schrödinger's Cat"

Presented by Professor Serge Haroche, Nobel Laureate for Physics 2012

Date: Monday, 11th November 2013

Venue: Mahony Hall, The Helix, Dublin City University

10:30am Students arrive

10:45am Students are seated

11:00am Presentation begins

11:45am Q&A session with audience

12:15pm Event concludes

We very much hope your students can join us on the day. To register a class for the event please contact Colette O'Beirne, DCU School Liaison Office, by email at colette.obeirne@dcu.ie or by telephone 01 7008510. Please note there are a limited number of places available.

A prize will be awarded for the best question submitted during the event. Please encourage your students to bring their mobile devices and submit their questions using the hashtag, #dcumagnetnobel.

Abstract: ‘Shedding new light on Schrödinger’s Cat’, Professor Serge Haroche

The quantum world is bizarre. At this subatomic level, things happen that seem odd and counterintuitive, and for almost a century this quantum ‘strangeness’ has intrigued some of the finest minds in physics.

In the early days the founding fathers of the field used “thought experiments” to manipulate and observe quantum systems according to their newly discovered strange and counterintuitive laws. And, back then, people believed that these experiments would remain forever virtual.

But thankfully, that was wrong. Now quantum experiments can get real. Advances in technology mean that we can actually control and manipulate isolated quantum particles in ways which were previously thought impossible to achieve.

Today labs around the world are carrying out these real quantum experiments, opening up new domains of research at the frontier between physics and information science. Why? To explore the transition between the subatomic world - where quantum laws are dominant - and our macroscopic environment, the world we can see, which appears to be “classical”.

More practically, physicists are hoping that these experiments will open the way to new technologies that can exploit the strange logic of the quantum world to build more powerful and faster computers. It could also help us to communicate or measure physical quantities in new and better ways, leading to better satellite-based navigation or more sensitive systems for predicting earthquakes. In this way, the tiny scale of quantum physics could be put to use with truly global effect.

In the Ecole Normale Supérieure in Paris, Professor Haroche’s experiments ‘trap’ microwave photons between highly reflecting superconducting mirrors so he can observe how they interact with atoms. He can count the photons without destroying them, record field quantum jumps and prepare superposition states of radiation analogous to the famous “Schrödinger’s cat” that the Austrian physicist (and long-time Dublin resident) Erwin Schrödinger had imagined to be suspended between life and death. He has also studied the decoherence of these states, which is the process by which they lose their strange “quantumness” in a short space of time.

Professor Haroche will give a simple description of these experiments, and talk about the possible applications of these studies.

Should you require any additional information, please do not hesitate to contact me

Kind regards

Colette
Schools Liaison Office
Dublin City University