



European Research Council

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Press release

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Nobel Prize in Physics 2012 goes to European Research Council grantee

After the Royal Swedish Academy of Sciences announced the news that the Nobel Prize in Physics for 2012 has been awarded to Professors Serge Haroche (France) and David J. Wineland (United States) for "ground-breaking experimental methods that enable measuring and manipulation of individual quantum systems", the President of the European Research Council (ERC), Prof. Helga Nowotny, said: *"On behalf of the ERC Scientific Council, I would like to extend warm congratulations to the Nobel Prize laureates announced today. We are very proud that Professor Serge Haroche has been funded by the European Research Council through an Advanced Grant. This is the second time that the Nobel Prize in Physics has gone to an ERC grant holder, which is particularly thrilling for the ERC, set up only five years ago. Through a highly competitive selection based on excellence alone, the ERC has supported nearly 3,000 top researchers thus far. Today's announcement is affirmation of the ERC's investment in the most talented researchers across Europe, whose contributions are invaluable to science, and in the longer term to society at large."*

The Commissioner for Research, Innovation and Science, Máire Geoghegan-Quinn, said: *"I heartily congratulate Professors Serge Haroche and David J. Wineland for their well-deserved Nobel Prize. I am particularly proud that Professor Haroche is the holder of an Advanced Grant, awarded in 2009 by the European Research Council (ERC). The ERC supports the very best researchers to conduct pioneering research across Europe, and has made a real impact since its launch in 2007. This is why the Commission has proposed a significant boost for the ERC budget in our next research and innovation programme, Horizon 2020."*



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Background

Today, Professors Serge Haroche (Collège de France and Ecole Normale Supérieure, Paris, France) and David J. Wineland (National Institute of Standards and Technology (NIST) and University of Colorado Boulder, USA) were jointly awarded the 2012 Nobel Prize in Physics for ground-breaking experimental methods that enable measuring and manipulation of individual quantum systems.

Professor Haroche has received a prestigious ERC Advanced Grant from the European Research Council in 2009 for his project DECLIC, which explores the 'decoherence' of light in cavities, based at Centre National de la Recherche Scientifique (CNRS, France). This project studies the process of decoherence and can thereby open the way to create, as well as to maintain access and to use pure quantum steady states.

The research is a sequence of milestones; the first one was being able to preserve photons in a 'captive' state, but not absorbed by the surrounding matter. The next milestone was to enable the interaction with them without destroying them. Destruction after interaction is typical of quantum states: it can be compared to finding glasses placed on the floor of a dark room by breaking them with a hammer; if they crack, it confirms the presence of glasses. The methods developed are similar to being able to push a glass with soft gloves and have someone next to you who catches it before it reaches the floor. The next milestone was to show that if this quantum-non-destructive measurement is repeated at a high enough rate on a prepared photon, it reaches a 'frozen' state ('quantum Zeno effect'). These methods have been used in his DECLIC project to build the first example of a 'closed quantum feedback loop' capable of maintaining a quantum system in a steady (and accessible) non-classical state. This is a pre-requisite for the practical technological use of quantum features (including in quantum computers).

ERC Project: DECLIC 'Exploring the Decoherence of light in cavities'.

ERC funding: €2.5 million for 5 years

Today's award follows that of Prof. Konstantin Novoselov who was the first ERC grantee to receive a Nobel Prize (Physics Prize 2010 for his work on graphene; see [ERC press release](#)). In addition, the ERC is currently funding three researchers who were already Nobel Prize laureates when they won their ERC grants: American Prof. James Heckman (2000 for Economics; see ERC [press release](#)), German Prof. Theodor Hänsch (2005 for Physics; see ERC [press release](#)) and Frenchman Prof. Jean-Marie Lehn (1987 for Chemistry).

Furthermore, the ERC's governing body, the Scientific Council, currently includes two Nobel Prize winners amongst its members, namely British researcher [Sir Tim Hunt](#) (Nobel Prize for Physiology or Medicine 2001) and German scientist [Christiane Nüsslein-Volhard](#) (Nobel Prize for Physiology or Medicine 1995).

Set up in 2007 by the EU, the **European Research Council** is the first pan-European funding organisation for frontier research. It aims to stimulate scientific excellence in Europe by encouraging competition for funding between the very best, creative researchers of any nationality and age. The ERC also strives to attract top researchers from anywhere in the world to come to Europe.



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It funds young, early-career top researchers ('ERC Starting Grants'), already independent excellent scientists ('ERC Consolidator Grants'), and senior research leaders ('ERC Advanced Grants'). The substantial funding is awarded based on peer review evaluation and can amount to €3.5 million. The ERC operates according to an "investigator-driven", or "bottom-up", approach, allowing researchers to identify new opportunities in any field of research. There is currently a call for Advanced grants open until 22 November 2012.

The ERC, which is a pioneering component of the EU's Seventh Research Framework Programme ('Ideas' Specific Programme), has a total budget of €7.5 billion from 2007 to 2013. The European Commission has proposed a significant boost of the ERC budget to over €13 billion in the new framework programme "Horizon 2020" (2014-2020).

The ERC is led by the ERC Scientific Council, composed of 22 top scientists and scholars, and the ERC President is Prof. Helga Nowotny. The ERC Executive Agency implements the "Ideas" Specific Programme and is led by Director Pablo Amor.

For more information:

ERC website

<http://erc.europa.eu>

Nobel Prize announcement

http://www.nobelprize.org/nobel_prizes/physics/laureates/2012/press.html

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