

Garching, 7 November, 2012

Press Release

Lundbeck Foundation Talent Prize for Dr. Anne Ersbak Bang Nielsen

Dr. Anne Ersbak Bang Nielsen, a young research scientist in the Theory Division of Professor Ignacio Cirac at the Max-Planck-Institute of Quantum Optics (Garching near Munich) has been awarded the talent prize of the Lundbeck Foundation. The foundation, whose headquarters is located in Copenhagen (Denmark), supports high-level research within the health and natural sciences. Each year, it awards up to three talent prizes to very promising young scientists who are less than 30 years old. The selection is based on recommendations submitted by leading scientists at Danish universities or other research institutions.



Anne Nielsen, born in 1982 in Denmark, studied physics at Aarhus University, Denmark, where she received her Master degree in 2008. There she also carried out her Ph.D. studies in physics in the group of Professor Klaus Mølmer, completing her thesis "State Preparation and Conditional Dynamics of Quantum Systems" in April 2010. From January 2009 to June 2009 she worked as a visiting researcher at Stanford University, California, USA, in the group of Professor Hideo Mabuchi. This visit was funded by a "The Danish Minister of Science, Technology and Innovation Elite Research Scholarship."

This highly renowned program has the purpose to give very talented Ph.D. students the opportunity of staying at an outstanding university abroad. After having worked as a research assistant at Aarhus University from May 2010 to July 2010, she joined the Theory Division of Professor Ignacio Cirac at the Max-Planck-Institute of Quantum Optics.

During her Ph.D.-studies, Anne Nielsen has, together with her supervisor Professor Klaus Mølmer, proposed and analyzed various protocols for generating interesting quantum states of light and atoms. This work concerned for example topics like conditional measurements, optical parametric oscillators, cavity QED, and Rydberg blockade. During her visit at Stanford University she worked with model reduction in measurement based quantum feedback control, and together with Professor Hideo Mabuchi and Dr. Asa Hopkins, she proposed a method to reduce the amount of computations needed in quantum feedback loops. At MPQ, Anne Nielsen investigates the behaviour of quantum many-body systems. In cooperation with Professor Ignacio Cirac and Professor Germán Sierra from the Instituto de Física Teórica, UAM-CSIC, in Madrid, she is constructing and analyzing spin models by using tools from conformal field theory and numerical computations. In particular, the team has constructed models involving states that are very close to fractional quantum Hall states, but are defined on lattices.

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Anne Nielsen was recommended for the prize, which is donated with 100,000 DKK (about 13,400 EUR), by her Ph.D. supervisor Professor Klaus Mølmer. The prize ceremony took place at Carlsberg Akademi in Copenhagen, Denmark, on October 31, 2012.

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